Chapter 5

Fixed Gear Sampling

Focus Questions:

- What is a fixed gear vessel and how does it operate?
- How is information collected on fixed gear vessels and what forms are used?

Chapter Outline:

I. Fixed Gear Description

II. Collecting and Documenting Trip and Total Catch Information

III. Collecting and Documenting Catch Category Weight

IV. Collecting and Documenting Species Composition

V. Examples

I. Fixed Gear Description

Hook and Line Gear

Numerous varieties of commercial fishing gear use hooks and lines in different configurations to catch finfish. The most common gear configurations include longline, vertical hook and line, jigs, handlines, rods and reels, vertical and horizontal setlines, troll lines, and stick (pipe) gear.

Longline Gear

Groundline/Mainline- The length of line to which all of the hooks are attached. This line is the "backbone" of the longline gear.

Gangion- The length of line that connects the hook to the groundline. It is often one to two feet long.

This gear type involves the setting out of a long horizontal line (**groundline/mainline**) to which other short lines (**gangions**) with baited hooks are attached. The groundline is secured between anchored lines and identified by floating surface bouys, bamboo poles, and flags. The groundline is laid along or just above the ocean floor (bottom longline) (See Figure 5-1).

To deploy longline gear, the vessel sets the first anchor and then steams ahead, following a selected pathway with the groundline and baited hooks being set off the stern of the boat. Hooks are usually baited by hand with squid, herring, octopus, or cod. Hooks of various sizes are attached to gangions of various lengths that are tied on or snapped onto the line at desired intervals. Hook size and spacing, depth, and soak time (fishing time) vary.

Block- A hydraulically driven wheel into which the groundline is placed during gear retrieval. As the wheel spins the groundline is drawn aboard.

Rollerman – A crewman who stands where the fish are coming in and brings them aboard using a gaff.. The rollerman lands any commercially valuable fish and excludes any non-commercially valuable fish from being landed.

Crucifier- A pair of rollers or steel pegs which stand vertically with only enough room for the groundline to pass between. During gear retrieval, the groundline passes between the rollers and the hooks are pulled out of the fish.

Longline gear is retrieved by pulling in the groundline and landing one gangion and hook at a time. On most longliners (See Figure 5-2), the vessel pulls the buoy aboard then pulls up the anchor using a **block**. The **rollerman** transfers the groundline to the block and begins hauling the groundline. The line comes in over the rollers, through the **crucifier**, over the block, and then is coiled. A rollerman stands at the railing of the vessel and helps the fish aboard. Some longliners on the West Coast manually pull the buoy

anchor and groundline aboard. Sablefish, Pacific halibut, spiny dogfish, and other groundfish are often targeted with longline gear.

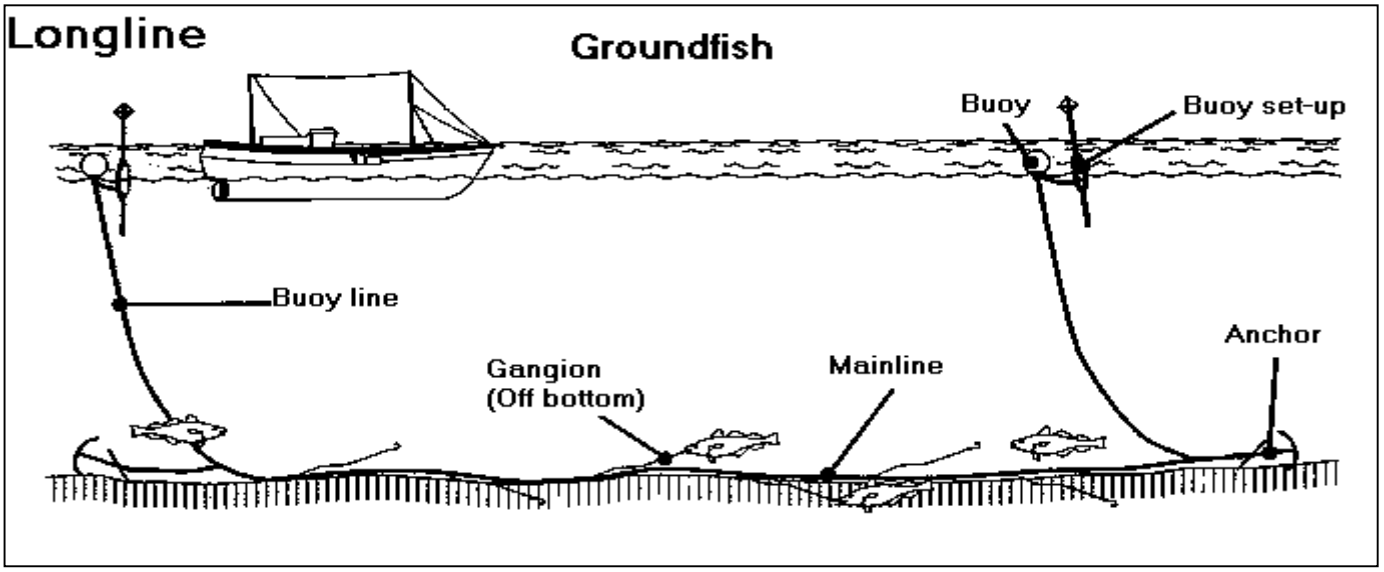

Figure 5 -1: Longline Gear Set-Up

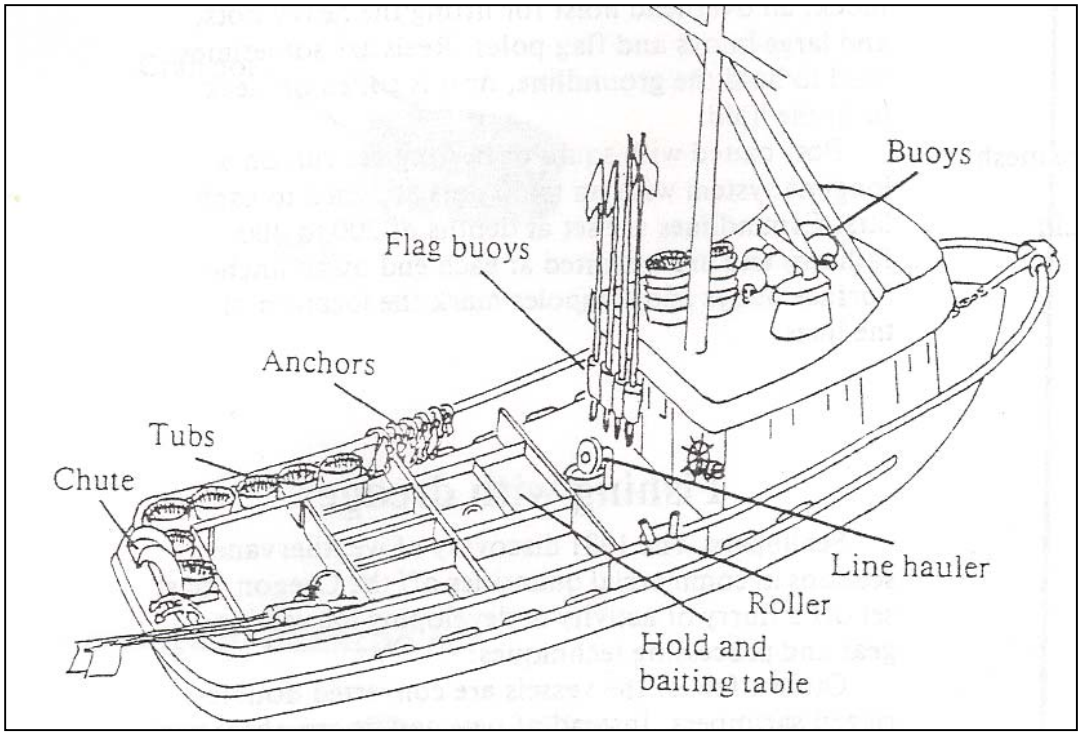

Figure 5 - 2: Longline Vessel

Handline and Jig Gear

Jigging – A method of fishing where fishing line is either mechanically or manually manipulated. The movement of the line creates a bouncing of the lure within the water column or along the substrate.

Hoochies- A rubber lure that looks like a small squid and is available in a variety of colors.

Handline and **jig** fisheries use vertical, weighted monofilament lines with baited hooks attached at intervals with swivels. The hooks are attached to the groundline and are dressed up with colorful segments of rubber surgical tubing, **hoochies**, or bait (herring or other fish). The jig is dropped to the bottom either by hand or with mechanical gear. The line is then usually lifted a short distance off the bottom and jigged vertically up and down to produce movements of the hoochies or bait to induce the fish to bite.

Mechanical jigs (See Figure 5-3) are automated to let out and reel in line as programmed. They can be programmed to sense when the gear hits the seabed and automatically pull in enough line so that the hooks stay a few feet above the bottom to avoid snagging. When the pre-set weight of fish has been hooked, the jigger can automatically reel in the line. Mechanical jiggers will generally utilize between six and sixteen hooks on gangions and many lines can be actively jigged. Handlines and jigs are used to harvest lingcod, greenlings, cabezon and rockfish.

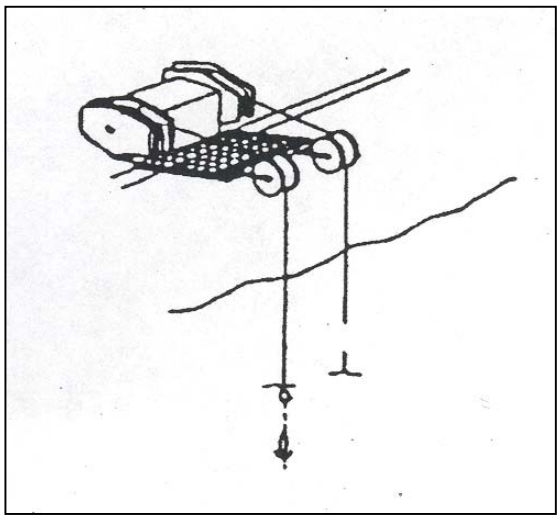

Figure 5 - 3: Mechanized Jig Assembly

Stick (Pipe) Gear

Stick (Pipe) gear is usually a piece of rebar (metal stake) or PVC tube with rebar inside that has string or twine attached at both ends (See Figure 5-4). Some fishers use a flexible plastic coated cable with a lead weight attached instead of a hard stick, referred to as 'cable gear". Hooks are attached directly to the string and baited with squid, mackerel, or bonita. This gear is often used in shallow water kelp and surf grass beds (0-40 ft). Usually there is only one stick per buoy line, but multiple sticks can be connected together by groundline. The sticks can range in size from 3-6 ft in length. Hooks per stick can vary from 3-10 hooks. Stick (Pipe) gear is used to target shallow and deep near shore rockfish, lingcod, greenlings and cabazon.

Figure 5 - 4: Stick Gear

Rod and Reel Gear

Fishers using rod and reel gear utilize traditional fishing poles, usually with two or more hooks on each pole (See Figure 5-5). Flashers, hoochies, and bait are used to attract fish to the hooks. Lines may be cast or trolled and are weighted with round, pyramid, or crescent shaped sinkers. Weighted lines and hooks are cast overboard and allowed to descend to the desired depth. When a fish is on the line, they are reeled back in. When multiple hooks are fished, each hook may be fished from "dropper" line attached to the main fishing line. Rod and Reel gear targets rockfish, CA sheephead, sanddabs, lingcod, greenlings and cabezon.

Figure 5 - 5: Rod and Reel Gear and Catch

Vertical Hook and Line (Also called vertical longline, buoy or Portuguese longline)

Vertical longline gear is used in Southern California and Oregon. This hook and line gear involves a single line weighted at the bottom and buoyed at the surface so as to fish vertically. Baited hooks are tied to the mainline (See Figures 5-6). Wind and waves jiggle the buoy, which wiggles the line and hooks to attract fish. Vertical Hook and Line gear is used to target rockfish.

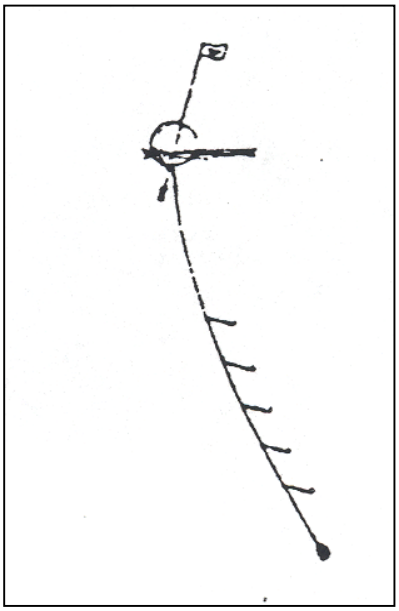

Figure 5 - 6: Vertical Hook and Line Gear and Vertical Hook and Line Gear Schematic

Troll Gear

Outrigger-
Any pole that can be lowered over the side of a boat used to enhance stability and aid in fishing

Trolling involves towing multiple fishing lines behind a vessel (See Figure 5-7). Fish lines are attached to a pair of **outriggers** that are lowered to approximately 45-degree angles from the boat when fishing.

Gurdies-
Powered spools or reels

Fishing lines are set and retrieved using **gurdies** mounted on the vessel in sets of two, three or four. Each gurdy spool, usually powered by hydraulics, contains and works one main line.

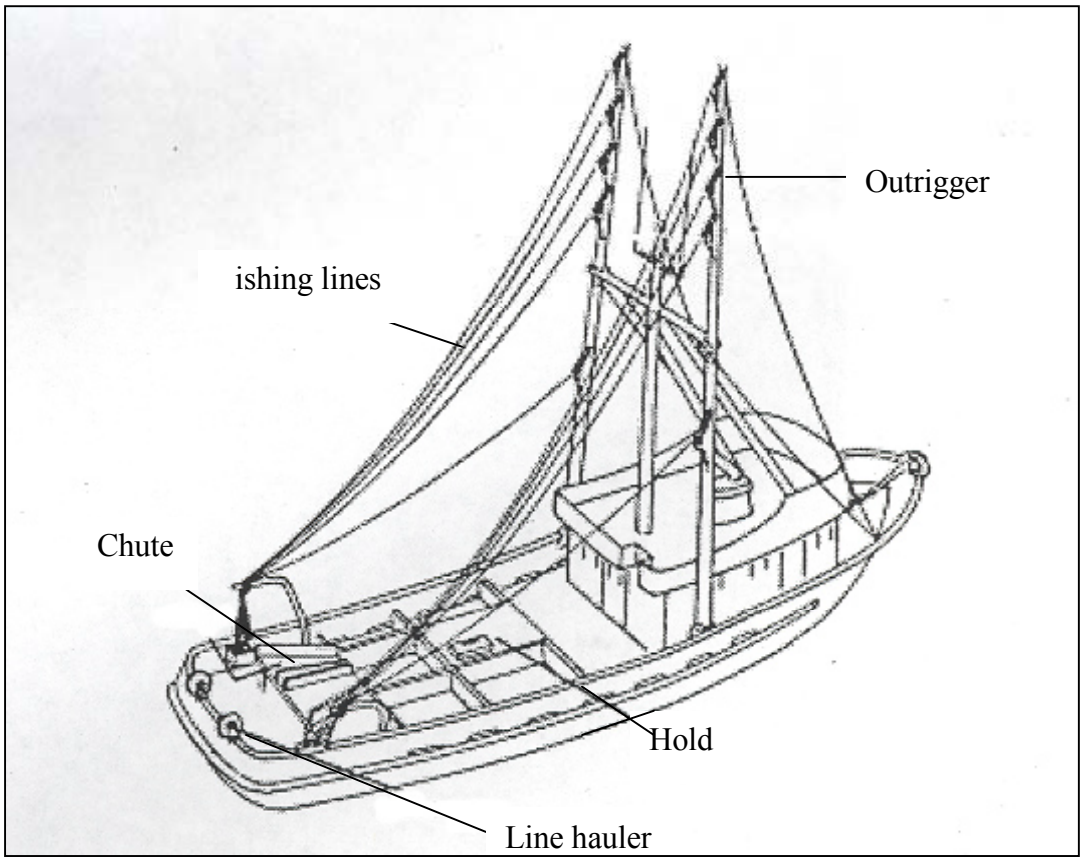

Figure 5 - 7: Troll Gear (with outriggers in non-fishing position)

Albacore Troll Fishery

Vessels targeting albacore tuna range in size from 40 feet to 70 feet and tow up to 13 lines from the outrigger poles and the stern. Lines are generally unweighted and a single lure called a 'jig' is attached to the end of each (See Figure 5-8). Jigs have metal heads, plastic skirts or feathers, and large, barbless double hooks. Fish are pulled aboard by hand or by line haulers (pulleys) located on the stern.

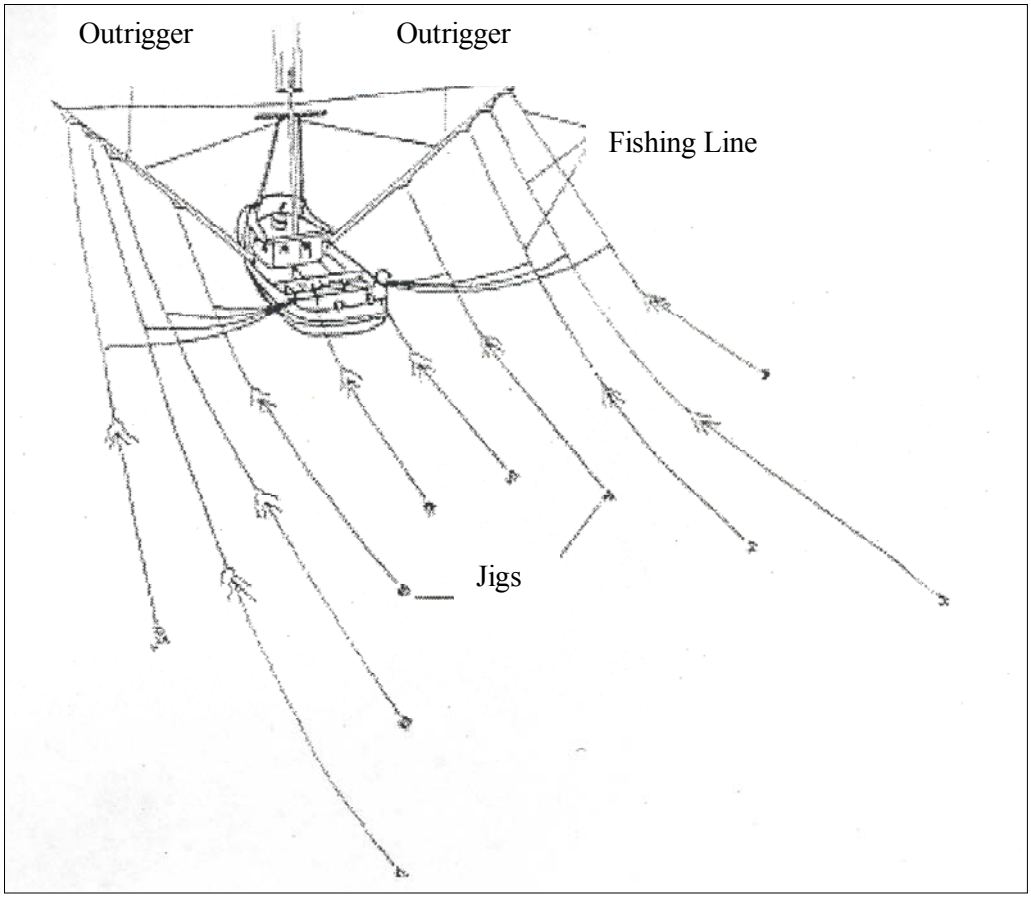

Figure 5 - 8: Albacore Troll Vessel (with outriggers in fishing position)

Groundfish Troll Fishery

Groundfish are targeted using several varieties of troll gear. One of the more common types utilizes a five to seven foot bar. The gear is often called 'dingle bar' gear because there is a distinct 'ding' transmitted up the steel trolling wire any time the bar touches bottom. The gear is designed to be fished three to six feet above rocky bottom and the iron bar is allowed to touch the bottom only occasionally to adjust for varying depths. Fishing lures are hung from multiple gangions attached to each line. The jigs are baited with large plastic worms called 'scampies' and are sometimes tipped with bait. This gear is very selective and is used primarily to target lingcod or Pacific halibut.

Other groundfish trolling is similar to above described 'dingle bar' gear, except it uses a bent steel bar rigged at the end of the steel main line (trolling wire). The bend in the bar assists the bar to slide over the seabed or rocks. It is attached to the mainline by a breaking strap that will break if a hang-up occurs. Gangions with weighted hooks are connected to each swivel of the string. At the end of the string, a rigid plastic float is rigged to provide drag and flotation to keep the string and hooks horizontal and suspend the hooks just above the bottom. Ten to fifteen of these strings may be attached to main line above the bent weight bar at various depths to target rockfish congregating at different depths around rock pinnacles.

To fish a number of depths near the surface, floats are rigged on the main lines and heavy weights are attached to their ends. By adjusting the weights, length of main line and location of gangions, the hooks can be rigged to fish a range of depths within the desired band (See Figure 5-9).

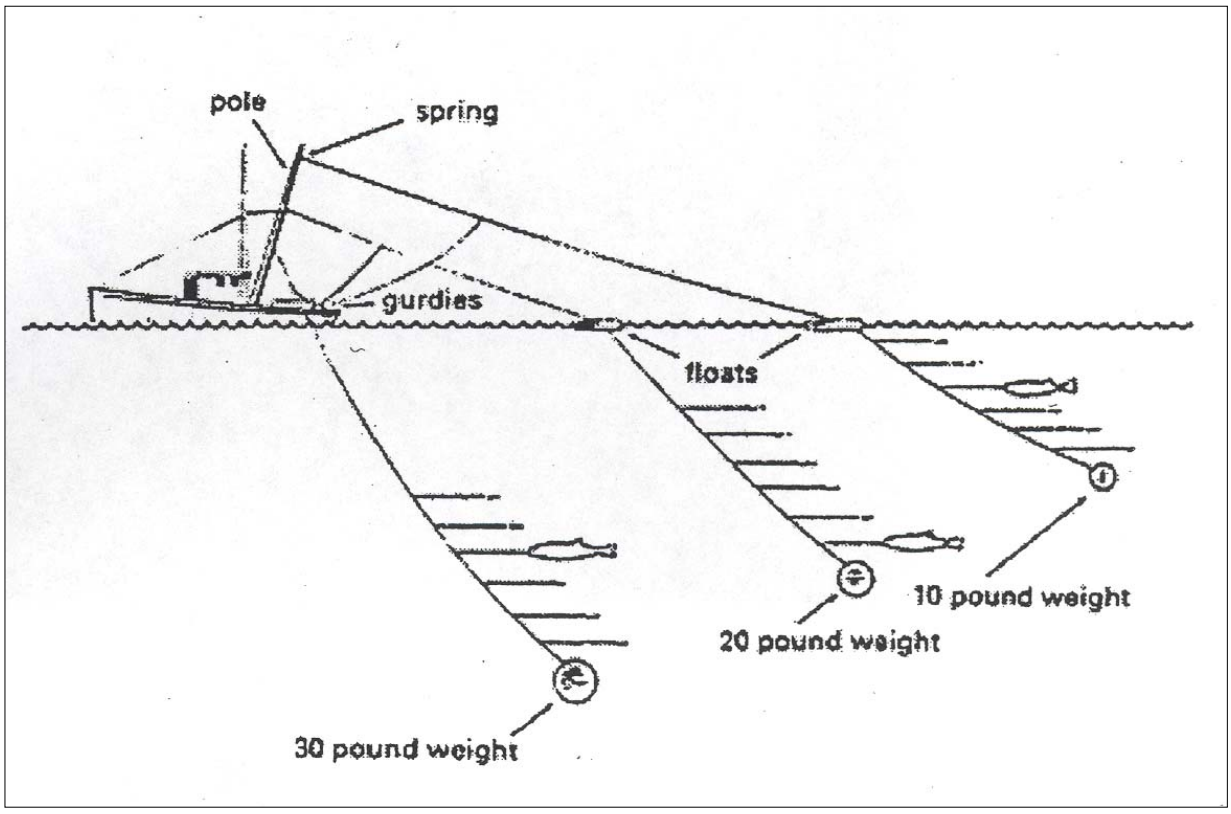

Figure 5 - 9: Groundfish Troll Gear

Pots

The words "pot" and "trap" are used interchangeably to mean baited cages set on the ocean floor to catch fish and shellfish. They can be circular, rectangular or conical in shape. The pots may be set out individually or as strings with multiple pots attached to a groundline (See Figure 5-10).

All pots contain entry ports and escape ports that allow undersized or unwanted species to escape. Additionally, all pots must have biodegradable escape panels or fasteners that prevent the pot from continuing to fish if lost.

Strings of pots are marked at each end with a pole and flag, and sometimes a light or radar reflector. Individual pots are marked with surface bouys.

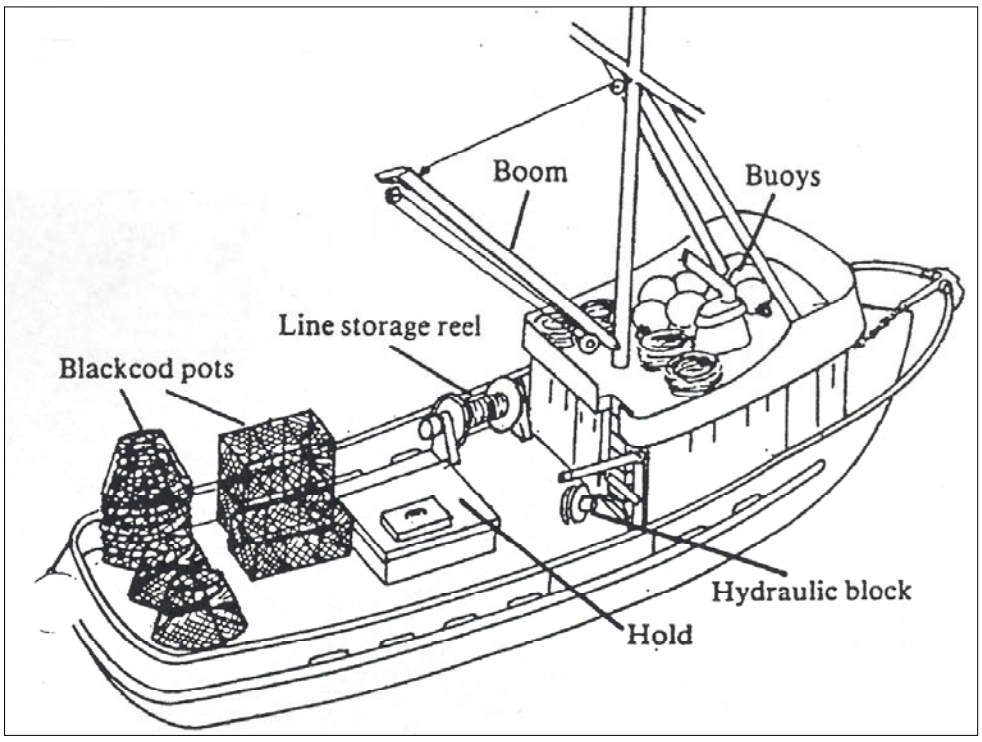

Figure 5 - 10: Trap Vessel

Sablefish Pots

Sablefish pots are fished in strings weighted with anchors at each end and marked at the surface with buoys and flagpoles. The pots are rectangular, trapezoidal, basket, or cylindrical in shape and usually weigh less than 50 pounds (See Figure 5-11). Rectangular and basket-shaped pots have collapsible bottoms so more pots can be stacked on deck. Pots are set and retrieved using line haulers and hydraulic blocks and overhead hoists. Pots are baited with squid, hake, or herring.

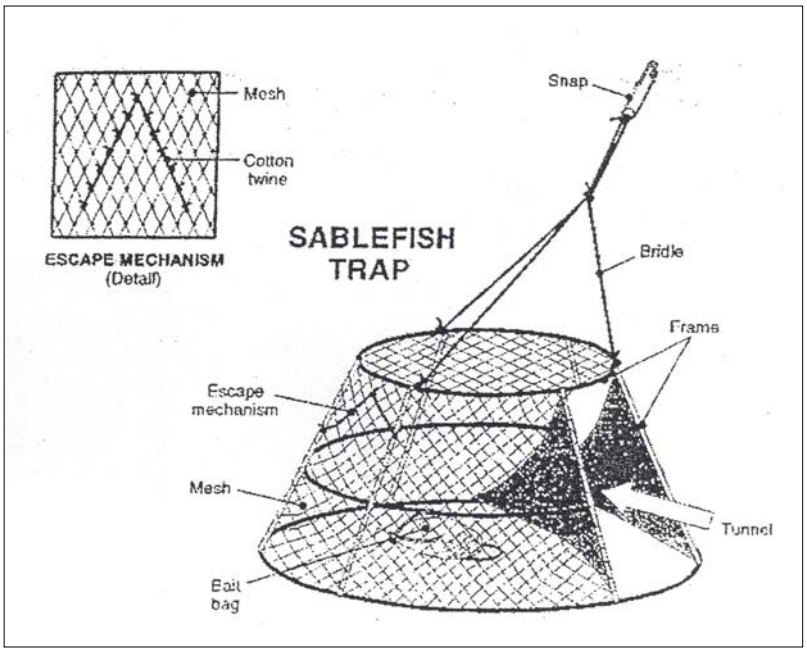

Figure 5 - 11: Sablefish Trap Schematic

Other Groundfish Pots

Pots used in this fishery are often rectangular or conical in shape and are generally constructed of twine meshes on a steel framework (See Figure 5-12). Target species are California sheephead, cabezon, kelp and rock greenling, California scorpion fish, and several species of rockfish.

Figure 5 - 12: Sheephead Trap

Safety Concerns on Fixed Gear Vessels

There are several safety concerns on fixed gear vessels of which Observers should be especially aware. Safety First!!

It may be necessary to sample near the roller station or the block where moving hooks or pots pose a serious threat. It is not uncommon for crewmembers to be seriously injured by incoming and outgoing hooks or pots. If a moving length of line becomes entangled around a leg or an arm, the line can drag a person overboard or into machinery.

While aboard a pot vessel, Observers should be conscious of their surroundings at all times. Be aware of coils of line attaching the buoys to the pot. These are deployed as the pot is launched and have been known to wrap around ankles and drag crew overboard.

Lastly, decks are often awash with water, fish entrails, and whole fish, making them very slippery. In order to reduce the risk of injury, always be conscious of dangers in the immediate area.

Diversity of Fleet and Effects on Sampling

Although the fixed gear fleet is very diverse, sampling protocols are consistent on all hook and line and pot vessels (with the exception of prawn pot). There are, however, a number of vessel characteristics that influence catch sampling. The most important characteristics that affect sampling are:

Fixed gear vessels range in size from kayaks to 70'.

- **Size –** Although the amount of catch on fixed gear vessels is usually small, limited deck space may cause difficulties when sampling. Lack of storage space for catch can affect sample size and often there is not room for a platform scale, making it necessary to rely on hand scales.

Fixed gear vessels land between 50 lbs. and 10,000 lbs. per trip.

- **Landing Weight** – The majority of fixed gear vessels participate in the open access portion of the fishery. The open access quota is around 800 lbs. per day. However, there are Limited Entry fixed gear vessels that land thousands of pounds per trip.

Conventional longline gear may or may not have distinguishable gear units. Check with skipper prior to first haul.

- **Gear** – The most important distinguishing characteristics regarding gear is whether or not it has definable smaller units. Gear that has definable smaller units can be randomly subsampled while gear that does not have definable smaller units must be 100% tallied.

Sometimes, weighing retained fish in the live fish and other fisheries is impossible. Tally sample them by species and use landed weights to get a weight per haul.

- **Live vs. Dead** – Many vessels participate in the live fish fishery. Skippers vary on their willingness to have the Observer weigh live retained fish. In a number of fisheries, including the live fish and dory fleets, discard is frequently released alive. This requires the Observer to be conscientious about not increasing the mortality of discard.

Total # of Hooks for the Trip Form = The total number of hooks for that set

- **Total # of Hooks** – Counting hooks can be tricky. On certain gear types, this means not only counting the number of hooks/skates/poles/tubs/etc. but also counting the number of times each skate/pole/tub/etc. is brought above the waterline.

A grouping of gear can be considered one set if the following are the same:

1. Depth
2. Geographic Area
3. Species
4. Gear Type
5. Date

- **Sets** – Longline gear or strings of pots are easily defined as a set. However, in many of the other fisheries defining a set is difficult. In these fisheries sets are often defined by geographic area, depth, gear type, and species composition. If none of those factors change during a day of fishing, then all gear pulled that day is considered one set.

II. Collecting and Documenting Trip and Total Catch Information

Managers have the same data needs for fixed gear vessels as they do for trawl vessels. Fishing Effort Information including dates, times, locations, etc. are collected by Observers on Fixed Gear vessels and documented on the Trip Form.

Trip Form -Instructions for Completing the Observer Trip Form on Fixed Gear Vessels

An entry must be made for every set a vessel makes while the Observer is aboard. The Trip form is separated into two sections:

- Trip Form – Haul Locations.
- Trip Form – Hauls.

Most of the information on the Trip form (See Figure 5-13 and Figure 5-14) does not require any sampling. The exception is the Observer Total Catch Estimate. Although fixed gear vessels are not required to keep Vessel Logbooks, most skippers will keep a personal log. Ask the skipper to borrow this log to complete the Trip Form. If the vessel does not record its fishing effort information anywhere, the Observer must record this information for themselves. Following the form instructions, procedures for obtaining Observer Total Catch Estimates on fixed gear vessels is discussed.

TIP * It is important for Observers to complete the Trip Form-Haul Locations after each haul.

Trip Form – Haul Locations

- **Fishery Type –** Circle the fishery the vessel was participating in. If the vessel was participating in an EFP fishery, document the name of the EFP in the Trip Notes.

- **Coast Guard Number** – Some Limited entry and open access fixed gear vessels will have a six or seven digit USCG number. **If the vessel does not have a USCG number, leave entry field blank and fill in the State Registration Number field.**

- **Trip Number** – This number is automatically generated by the database system. Complete this field once the trip has started to be entered into the database.

  

  TIP* Some Observers find it easier to start a trip prior to leaving port. Doing this allows the Observer to fill in the Trip Number while at-sea rather than when the Observer returns to port.

- **Observer Name** – Record your first and last name.

- **Year** – Record the year as YYYY.

- **Vessel Name** – Record the full name of the vessel.

- "**Washington-Oregon-California Groundfish Logbook" Number** - This field is left blank on all fixed gear vessels. If the vessel is keeping a Logbook, document the name and page number in the Trip Notes section.

- **Skipper First Name** – Record the first name of the skipper.

- **Skipper Last Name** Record the last name of the skipper.

- **State Registration Number** – Use this field only if the fixed gear vessel does not have a USCG number. The state registration number will begin with a CF in California, OR in Oregon, and WN in Washington.

- **Departure Date/Time** – Document the date and time the vessel left port.

- **Departure Port** – Document the port the vessel departs from.

- **Landing Date/Time** – Document the date and time the vessel returns to port.

- **Landing Port** – Document the port the vessel returns to.

- **Fish Tickets and State Agency Code** – Obtain the numbers of all landing receipts (fish tickets) from the vessel skipper, the port biologist, or the state liaison. **This is a required field for all fisheries and trips!** The state agency code will be C - for California deliveries, O – for Oregon deliveries or W – for Washington deliveries.

- **Trip Notes** – Document any information pertinent to understanding the trip.

- **Haul/Set Number** – Number hauls consecutively, starting with haul 1 for each trip. **Number the hauls in the order they were retrieved, not set!**

Tip * When there is more than one set in the water, pay attention to which set is being hauled (monitor bouys). Vessels often haul gear in a different order than it was set.

- **Start and End Date** – Document the date the haul was set and the date the haul was retrieved as MM/DD.

- **Start and End Time** – Document the Pacific Standard Time (PST) the haul was set and retrieved in 24-hour notation (military time). A haul starts when the first set of buoys is thrown from the vessel or when the first piece of gear goes into the water. The haul ends when the last hook or pot is brought aboard.

Loran
If Observers are on a vessel that is using Loran C, document the Loran coordinates. Send these to the coordinator in an Excel spreadsheet and they will return the latitude and longitude positions.

- **Start and End Latitude** – Document the location of the first buoy set as the start latitude. Document the location of the final buoy set as the end latitude. Record latitude in degrees, minutes, $1/100^{th}$ of a minute.

- **Start and End Longitude** - Document the location of the first buoy set as the start longitude. Document the location of the final buoy set as the end longitude. Record longitude in degrees, minutes, $1/100^{th}$ of a minute.

- **Depth** – Document the fishing depth in fathoms.

Fathoms
1 fathom = 6 feet

- **Gear Type** – Enter a code for the gear type based on the configuration of the gear. If the Observer is on a vessel using a type of fixed gear not listed, please contact a Coordinator/Debriefer for instructions.

  6 – Longline or Setnet.
  7- Vertical Hook and Line Gear.
  8 – Pole (Commercial).
  9 – Other Hook and Line Gear.
  10 – Fish Pot.
  15 – All Troll Gear.
  16 – All Other Miscellaneous Gear.

  ****If the vessel is not using one of the above gear types, this is most likely the wrong section of the manual. Please refer to Chapter 4 – Trawl and Prawn Vessels. ****

- **Target Strategy** - Enter the vessel's target strategy. Please refer to Appendix E for a list of target strategies.

LE OA __EFP

TRIP FORM - HAUL LOCATIONS

Page _____of _____

Observer name________________________________ Year ___________

USCG # ☐☐☐☐☐☐☐

Trip Number ☐☐☐☐☐

Vessel Name ___________________

Logbook # ______________________

Skipper First Name ________________

Skipper Last Name ________________

State Registration # (OA only)

____

Departure Date/Time ______________

Departure Port __________________

Landing Date/Time _______________

Landing Port ____________________

Fish Tickets	State Agency Code
☐☐☐☐☐☐☐	__________
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Trip Notes:

Haul/ Set #		DATE		TIME (24-hour clock)	LATITUDE		LONGITUDE		Depth of catch (fathoms)	Gear Type	Target Strategy
		Month	Day		Degrees	Minutes	Degrees	Minutes			
	Start[1]					.		.			
	End[2]					.		.			
	Start[1]					.		.			
	End[2]					.		.			
	Start[1]					.		.			
	End[2]					.		.			
	Start[1]					.		.			
	End[2]					.		.			
	Start[1]					.		.			
	End[2]					.		.			
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	Start[1]					.		.			
	End[2]					.		.			
	Start[1]					.		.			
	End[2]					.		.			
	Start[1]					.		.			
	End[2]					.		.			

Start[1] - Time the brake is set End[2] - Time the brake is set

Figure 5 - 13: Trip Form – Haul Locations

Trip Form-Hauls Instructions

- **Haul/Set Number** – Document the haul/set number that corresponds to the Haul Location information on the front of the form.

- **Observer Total Catch Estimate (OTC)** – Record the total catch estimate to two decimal places. Total catch estimate weight is recorded in pounds.

- **Volume of Codend or Trawl Alley/Bin** – This field is blank on fixed gear vessels.

- **Density** – This field is blank on fixed gear vessels.

- **Weight Method** – Enter the number for the weight method used to obtain the Observer Total Catch. The weight methods that may be used for fixed gear are:

  11 – Retained + Discard –
  When line is 100% tally sampled.

  8 – Extrapolation –
  When less than 100% of line is tally sampled.

Total Hooks/Pots
Always record the number of pots /hooks set, not retrieved in this column. If gear is lost, use gear performance code 5 and document how much gear is lost in the comments sections.

- **Total Hooks/Pots** – Document the total number of hooks/pots in the set. **Be sure to record the amount of gear set, not retrieved!!**

- **Gear Performance** – Record one of the following codes to document gear performance.

  1 - No problem.
  2 - Pot was in the haul.
  5 - Trawl net or codend lost, pot(s) lost, other gear lost (If pots/hooks have been lost, document in the comments section how many were lost.).

7 – Other problem – Document any other gear related problems in the comments section.

- **Beaufort Scale** – This is not a required field at this time. Do not fill in unless otherwise directed by program staff.

- **Comments** – Document any information that is important about the haul. If the vessel lost gear, document the amount of gear lost in this column.

- **OTC Keypunch Check** – This is required for the Observer Total Catch Estimate field. Add all of the OTC's for an entire trip and record total weight of trip in the OTC keypunch check box (If there is more than one Trip form, add total catches of ALL hauls to obtain keypunch check.).

- **Total Hooks/Pots Keypunch Check** – This is required for the Total Hooks/Pots field. Add all of the Hooks/Pots counts for an entire trip and record total hooks/pots count of trip in the Total Hook/Pot keypunch check box (If there is more than one Haul form, add total hooks/pots counts of ALL hauls to obtain keypunch check.).

TRIP FORM - HAULS

Weight UM: LBS Volume UM: M^3 Density UM: LBS/M^3

Haul/ Set #	Observer Total Catch Estimate	Volume of Codend or Trawl Alley/Bin	Density	Weight Method	Total Hooks/ Pots	Gear Perf	Beaufort	Comments
Key-punch Check								

January 2003

Trip Form v. 2

Figure 5 - 14: Trip Form – Hauls

OTC on Fixed Gear Vessels

There are only two ways to calculate OTC on fixed gear vessels.

Weight Method 11 **– Retained + Discarded**
This method is used when 100% of the gear is tally sampled.

OTC = ∑ All Catch Categories on Catch Form

Weight Method 8 **– Extrapolation**
This method is used when less than 100% of the gear is tally sampled.

$$\text{OTC} = -\sum \frac{\text{All Catch Category Weights on Catch Form X Total \# Hooks in Set}}{\text{Number of Hooks Sampled}}$$

The OTC cannot be calculated on Fixed Gear vessels until the sampling has been completed and is the last calculation made each haul.

Prior to Sampling

Before sampling on a fixed gear vessel Observers must do two things:

1. Define A Set.
2. Determine The Amount Of Gear Fished In Each Set.

Defining A Set
Due to the wide variety of fixed gear types utilized off the West Coast, there are two distinct ways to define a set. The WCGOP Field Manual provides more detailed information on defining sets for specific gear types.

1. Longline and Pot String Sets.

- Gear consists of multiple hooks or pots attached to a groundline. Each end of the groundline is often anchored and is usually marked by a buoy.
- Gear is deployed, soaked and retrieved as a single unit defined as the "set".
- These sets are usually clearly designated in the skipper's logbook.
- Limited entry vessels fishing in Oregon and Washington generally fall into this category.

2. Other Line Gear and Pot Sets –
   - Line gear consists of single or multiple hooks attached to a line, stick, or rod. Pot gear consists of single pots deployed with a marker bouy.
   - Gear is deployed, soaked and retrieved as separate units. Even though the gear is not connected as one unit it is considered a single "set" as long as all the gear meets the following criteria:
     - Gear is the same type.
     - Gear is set the same depth range.
     - Gear is set in the same geographic area.
     - Gear targets the same species.
     - Gear is hauled on the same day.
   - These sets are usually NOT designated clearly in a logbook.
   - Most vessels fishing in the open access component of the fishery fall into this category.

Determining the Amount of Gear Fished In A Set

The amount of gear in a set is defined as the total number of hooks or pots set. A single hook or pot can be counted multiple times in one set if it is set and retrieved more than once. Observers must determine the total amount of gear used per set for all fixed gear vessels.

Lost Gear

Any lost gear, from a single hook or pot to entire strings, must be accounted for. It is important to determine the amount of gear **set**. OTCs are based on TOTAL HOOKS OR POTS SET, not retrieved!!

Pot Vessels

To determine the amount of gear fished on pot vessels simply count the number of pots the vessel brings aboard and determine if any pots were lost. **If pots are brought aboard multiple times during a single set, count each time they come aboard as a pot.** The only way to get a lost pot count may be to ask the captain.

Total Pots = Sum of All Pots Pulled + Lost Pots

Hook and Line Vessels

Sets on hook and line vessels can be broken down into two categories.

- **"Single Unit" Line Gear** – Has sets with no clearly identifiable gear units.
- **"Multiple Unit" Line Gear** – Has sets with clearly identifiable gear units.

Gear units can take many forms. Three examples of gear units observers are likely to encounter include:

- **Sticks –** Usually a rebar stake with a string of 4 or 5 hooks attached to it. Multiple sticks may be attached to a single line or they may be fished individually.

- **Skates / Tubs** – Sets of longline gear often consist of multiple segments of groundline tied together. These segments are generally referred to as skates or tubs (the line is frequently coiled into plastic tubs for storage). When gear is set, the skates/tubs are tied together. The 'skate-knots' that mark the break between two segments of line are generally visible during retrieval and may be used to distinguish individual gear units.

- **Poles** – Standard fishing poles. Usually each pole has two or more hooks.

Skate/Tub gear is the only type of hook and line gear where it may be difficult to determine if a set has multiple units. Differentiating between "single unit" and "multiple unit" line gear is extremely important. In sets of single unit line gear every hook must be sampled. In sets of multiple unit line gear, it may be possible to get an average hook count for the individual gear units so that only a portion of the hooks have to be sampled.

Single Unit Line Gear:
To determine the amount of gear fished in a single unit line gear set, it is necessary to count **all** the hooks.

Since with single unit line gear it is necessary to count all fish caught as well as hooks, it can be extremely difficult to get hook counts during retrieval. If it is necessary to weigh fish during retrieval as well, it can be impossible. There are several options for dealing with this situation. When sampling single unit line gear observers should (in order of preference):

1. Count hooks while they are being baited, while they are stored aboard the vessel, or while the vessel is setting gear.

2. If there are multiple sets of the same length, once a day only count hooks on one set. DO NOT SAMPLE THIS SET.

3. Count hooks and tally sample simultaneously during retrieval as best possible. *

   *If you are only able to count hooks during retrieval, document in the Observer Logbook the circumstances that required this.

Generally the only way to determine a lost hook count on single unit line gear is to ask the captain how many hooks were lost. If hooks were counted during the retrieval, add the number of lost hooks to the tallied hooks to obtain the total number of hooks.

Total Hooks = All Hooks Set

Multiple Unit Line Gear:
In multiple unit line gear, a set is composed of a number of individual gear units. To determine the amount of gear fished in a multiple unit line gear set, two pieces of information must be obtained.

1. The average number of hooks per gear unit.

2. The total number of gear units.

Average Number of Hooks:
Vessels generally have a consistent number of hooks per gear unit. Determining the average number of hooks per gear unit is a two-step process.

1. Determine the total number of gear units the vessel is using. This information can be obtained from the Captain or a crewmember.

2. Count the number of hooks per gear unit on **1/5** of the gear being used each trip. It is usually easiest to count hooks while they are being baited or while the gear is being set. Always document in the Observer Logbook when average hook counts were done and why that time was chosen.

Avg. Hooks per Gear Unit = $\frac{\text{Sum of Counted Hooks}}{\text{\# Gear Units Counted}}$

Number of Gear Units:
Determining the total number of hooks in a set is easier for some gear types then for others. The following section addresses typical methods for determining the total number of hooks for the three gear types (sticks, skates/tubs, and poles). Although all gear types are not specifically mentioned here, these methods can be utilized on all the gear types Observers will encounter. Refer to the field manual for specifics on the appropriate method for each gear type.

- **Sticks –** Many vessels fishing with stick gear will use each stick many times during one set. Each stick is easily identifiable and gear is pulled slowly enough to count every time a stick is retrieved. It may be possible to keep track of lost sticks during retrieval as well. If not, get a lost hook count from the captain or crew. To determine the total number of hooks in a set:

    1. Count every time a stick is brought out of the water.

2. Count the number of lost sticks.
3. Add the retrieved stick count to the lost stick count to get the total number of sticks fished.
4. Multiply the total number of sticks by the average hook count.

Total Hook Count = (Total Sticks) X (Ave. Hooks per Stick)

- **Skates/Tubs** - Skate or tub gear is fished with multiple skates tied together, not as individual units. It can be difficult to distinguish between individual skates during retrieval. If it is not possible to get accurate counts, it is acceptable to ask the captain how much gear was set and use his numbers. However, when using a captain's numbers, Observers are required to do an independent verification of skate counts for one haul each day. This is accomplished by counting skates during one of the following times:

  - While the gear is being set.
  - After a set is completed and gear is all on board.
  - While gear is being brought aboard.

  To determine the total number of hooks in a set:

1. Count the number of skates hauled.
2. Count the number of lost skates.
3. Add the retrieved skate count to the lost skate count to get the total number of skates fished.
4. Multiply the total number of skates by the average hook count.

Total Hook Count = (Total Skates) X (Ave. Hooks per Skate)

- **Poles** - Vessels fishing with poles (rod and reel) generally fish multiple poles at once and gear is retrieved and set numerous times in a rapid fashion. The rate at which gear is retrieved and reset can make it extremely difficult to keep an accurate count of the total number of hooks set. If it is not possible to count all retrievals of every hook, use the following procedure to calculate a total number of hooks for a set:

  1. Estimate the number of hours the vessel will be fishing that day.
  2. Divide the number of hours into small units. The number of hooks retrieved must be counted during at least **1/6** of the estimated time.
  3. Apply a random systematic sampling frame to select time units during which the number of hooks retrieved will be counted.
  4. During selected time units, count the number of hooks retrieved. It should be possible to continue to tally fish while counting hooks but it may be impossible to weigh the fish.
  5. Accurately record the actual amount of time the vessel fished.
  6. Multiply the number of hooks counted by the total fishing time then divide by time spent counting hooks to get the total number of hooks.

Total Hook Count = $\frac{\text{(\# of Hooks Counted) X (Total Fishing Time)}}{\text{Time Spent Counting Hooks}}$

Vessels Where Hook Counts Are Impossible to Obtain

There are a few vessels in Southern California fishing longline gear on which it is impossible for Observers to verify hook counts. The following circumstances combine to make counting hooks impossible:

1. All hooks must be tallied. This can be for any either of two reasons:
   - Single unit longline gear is being fished.
   - The skate knots marking the break between gear units are not readily discernable during gear retrieval.

2. The number of hooks per gear unit is extremely variable. This makes it impossible to use average hook counts to calculate a total hook count.

3. Vessel is retaining fish alive and discarding live fish so the Observer must weigh fish during the retrieval.

4. Gear is baited at an alternate location. Many fishers pay to have their gear baited. After a trip, they give their gear to the baiters who take it to a shop and bait it there. When the gear is returned, it's ready to be set.

To determine the number of hooks per skate on these vessels:

1. Ask the skipper after EACH skate/tub how many hooks were on that specific skate/tub.

2. Ask the skipper after EACH haul how many hooks were hauled. This is a way to double-check that the skate counts are correct. If there is a large discrepancy between the count the

skipper gave you for EACH skate/tub and the count for the haul, interview the skipper further about why this discrepancy took place.

Refer to the WCGOP Field Manual for more information regarding this method.

III. Collecting and Documenting Catch Category Weight

On fixed gear vessels, Observers must sample both retained and discarded catch. Since fish come up individually (on line vessels) or in relatively small quantities (on pot vessels), sampling on fixed gear vessels is relatively easy compared to sampling on trawlers.

The Observer may or may not be able to monitor the entire fixed gear set. When multiple unit line gear or strings of pots are hauled there are two distinct sampling periods: the tally and non-tally periods. Tally sampling on fixed gear vessels is conducted as the gear is being retrieved. When tallying on a line vessel, the Observer counts everything that comes up on the line, including drop offs, during randomly chosen gear segments or time periods. When tallying on a pot vessel, the Observer counts all the individuals that are in randomly selected pots.

Non-tally periods refer to the segments of gear or periods of time when the Observer is not counting individuals and gear is being retrieved. The non-tally period on line vessels is used for weighing organisms, measuring retained and discarded species, assessing injuries of Pacific halibut, and performing other duties. On pot vessels, the Observer can often weigh the fish from the sampled pot while the next pot is brought aboard. During "off" pots, the Observer can complete the biological sampling or other duties.

Tip* Vessels using single unit longline gear, sticks, poles, or single pots are, generally, 100% tally sampled. Weighing of fish and biological sampling is done in conjunction with tally sampling.

Catch Categories on Fixed Gear Vessels

The same 2 rules apply for catch categories on fixed gear vessels as trawlers and prawn vessels.

- Retained and Discarded species must be in separate catch categories.
- Pacific halibut is always in its own catch category.

Sampling Catch Categories

"# Of Hooks/Pots Sampled" on the Fixed Gear Catch Form should be the same for ALL catch categories!!

Retained and discarded catch is tally sampled on fixed gear vessels. Tally sampling is done by counting each individual that comes up by species. **Always tally the same number of hooks or pots for retained and discarded species.**

Where to Tally Sample

The tally station is where the Observer stands to count organisms as the groundline or pot is being retrieved. The tally station should be no more than six meters from where the fish are landed and the Observer should have a clear line of sight to the fish as they coming aboard. From the tally station, Observers must be able to clearly identify fish as they come aboard and identify drop-offs.

Equipment Needed

Three to six thumb counters and a clipboard will be needed. Prior Observers have devised many innovative techniques to make using multiple thumb counters easier. The most common is to use duct tape to attach multiple thumb counters to a clipboard. Other Observers have used duct tape and line to create thumb counter belts that fit

around the waist. Observers should be creative, experiment, and find out what works best.

When tally sampling, all individuals should be recorded to species. Some species are similar in appearance so it may not be possible to distinguish them to species. Examples of these are Rougheye and Shortraker rockfish or Shortspine and Longspine thornyheads. It is acceptable to tally these species to mixed groups such as Rougheye/Shortraker and Shortspine/Longspine.

Tally Random Sampling Methods

There are three types of random sampling on fixed gear vessels, spatial, systematic, and temporal. In all three types of longline sampling, begin sampling on a skate knot.

In the explanations below all the gear subunits (skates, pots or poles) are generically referred to as "skates".

Systematic Sampling (preferred)

Fixed-gear vessels routinely set over of a depth gradient or across different bottom types. This means the catch can vary significantly along a set. The best way to account for the variability caused by setting across a depth gradient or different bottom types is to use a systematic spatial random sampling frame. The procedure for systematic spatial sampling is as follows:

1. Verify how many skates are in the set.

2. Decide how many skates to sample, making sure to sample at least **1/3** of the set.

3. Break the set into sampling segments (n) by dividing the total number of skates by the number of skates that will be sampled. For example, there are 12

skates total and 4 skates are going to be sampled resulting in a sampling unit of 3 (12/4 = 3).

4. Choose which skate to start sampling from by selecting a random number that is between 1 and the sample unit (n).

5. Tally sample the randomly selected starting skate then tally sample every n^{th} skate after that.

Example of Systematic Sampling

1. The Observer on the Blue Dragon verifies with the skipper that 30 pots have been set.

2. The Observer decides to sample 1/3 of the pots set.

3. The Observer calculates the number of sampling units by dividing the total pots by the sample size (30 total pots / 10 pots = 3 units).

4. The Observer puts pieces of paper with the numbers 1, 2, and 3 into a hat and randomly selects the paper with the number 2.

5. The Observer begins tally sampling with pot 2 then samples every third pot after that. Pots 2, 5, 8, 11, 13 etc. are tally sampled by the Observer.

Spatial Sampling

Spatial sampling is gear-based and involves randomly selecting a portion of skates from the overall set to sample. The procedure for spatial sampling is as follows:

1. Verify how many skates are in the set.

2. Decide how many skates to sample making sure to sample at least **1/3** of the set.

3. Choose which skates to sample by selecting a set of random numbers. For example, there are 10 skates and the numbers 2, 5, 7, and 8 are drawn from a hat to select the skates to sample.

4. Tally sample the randomly selected skates.

Example of Spatial Sampling

1. The Observer on the Tiny Tim verifies that 10 pieces of rebar with hooks have been set in a small bay.

2. The Observer decides to sample about ¾ of the total gear set.

3. The Observer uses a random number table to select rebars 1, 2, 4, 5, 6, 7 and 9 to sample.

4. The Observer tally samples the randomly selected rebar gear.

Temporal Sampling

Temporal sampling is time based, therefore, the length of time it will take to haul a set must be known. The procedure for temporal sampling is as follows:

1. Verify the length of time needed to haul the set by asking the skipper or a crewmember.

2. Decide how much of the set to sample making sure to sample at least **1/3** of the total hauling time for the set.

3. Break the set into reasonable sampling time periods. For example, break a 4-hour hauling time into 30-minute sampling periods.

4. Choose which time periods to sample by selecting a set of random numbers. For example, there are 8 time periods and the numbers 2, 5, and 8 are drawn from a hat to select the time periods to sample during.

5. Tally sample the first skate that begins in each of the randomly selected time periods. Always start the sample on a skate knot! Never start sampling in the middle of a skate regardless of the timing.

6. If the crew is in the middle of hauling a skate when a sampling time frame occurs, wait until the end of that skate to start sampling. Sample for the entire time period. If the vessel is in the middle of a skate when the time period ends, continue to tally sample until the entire skate is on board!

Example of Temporal Sampling

1. The skipper on the Miss Fish tells the Observer that it will take about 3 hours to haul the longline set.

2. The Observer wants to sample ½ the set.

3. The Observer decides to break the set into 30-minute blocks of time, which results in a total of 6 sampling periods (180 min / 30 min = 6).

4. Since the Observer wants to sample ½ the set, he randomly selects 3 of the 6 sampling periods to sample during. Sampling periods 2, 3 and 6 are selected by randomly drawing cards from a hat.

5. When sampling period 2 begins (60 minutes after hauling starts), the Observer looks for the first skate knot to come up and begins tally sampling at that first skate knot, continuing until sampling time has elapsed and the final skate is fully sampled.

6. The Observer then waits for sampling period 4 to begin (90 minutes after hauling starts) looks for the first skate knot to come up and begins tally sampling at that first skate knot, continuing until sampling time has elapsed and the final skate is fully sampled.

7. The Observer continues in this fashion for each of the selected sampling periods.

Weighing Species on Fixed Gear Vessels

On many fixed gear vessels, it is possible to weigh the entire discard collected during a tally sample. However, in most cases average weights will need to be used for retained species. There are two options for collecting individuals for average weights:

- **During tally period** – The preferred method is to collect individuals during the observed tally period. When individuals are collected during the tally period, it ensures that all the species needed to obtain average weights are present. Collect and weigh at minimum 15 individuals of each non-targeted species and 50 individuals of the targeted species. **

- **During non-tally period** –The major problem with collecting individuals during the non-tally period is that all species in the tally sample may not be represented. If this happens, visually estimate species weights or use "like sets" to arrive at an average weight. Collect and weigh at minimum 15

individuals of each non-targeted species and 50 individuals of the targeted species. **

**Fixed gear vessels that day fish may not catch more than 50 of the targeted species. On a vessel that catches only limited numbers of targeted species, devise a random systematic frame and collect retained individuals for weights throughout the set(s). At least 15 individuals should always be used for average weights.

Random Sampling when Collecting Individuals for Average Weights

There are two methods to use on a fixed gear vessel to randomly collect individuals for average weight determinations. These two methods, spatial and systematic sampling, are detailed below.

In the explanations below all the gear subunits (skates, pots or poles) are generically referred to as "skates".

Spatial Sampling

Spatial sampling is a good method to use for species caught in **small** quantities.

1. Select skates to use for collecting individuals using one of the following two methods:

   - Select all non-tally sampled skates.
   - Randomly select one or more skates from the entire set.

2. Collect all individuals.

3. Weigh the collected individuals for average weight determinations.

Example of Spatial Sampling

1. The Blue Dragon sets 20 pots.

2. The Observer on the Blue Dragon randomly selects 13 of the 20 pots to tally sample by pulling numbers out of a hat.

3. The Observer uses the remaining 7 pots to collect and weigh individuals for average weight determinations.

Systematic Sampling

Systematic sampling is a good method to use for species caught in **large** quantities and **live fish** fisheries.

1. Select skates to use for collecting individuals using one of the following two methods:

   - Select all non-tally sampled skates.
   - Randomly select one or more skates from the entire set.

2. Systematically collect a portion of the total number of individuals.

   - Estimate the total number of individuals that will be caught in the sampling frame.

   - Divide the estimated total individuals by the number of fish needed (at least 15) to determine the collection frequency (n).

   - Collect every n^{th} individual.

3. Weigh the collected individuals for average weight determinations.

Example of Systematic Sampling

1. The Miss Fish sets a line with 10 skates.

2. The Observer on the Miss Fish randomly selects skate 2 to sample by selecting a number from a random number table.

3. The Observer estimates that 100 sablefish will be caught in skate 2.

4. The Observer wants to collect 20 sablefish to use for an average weight determination.

5. The Observer determines the frequency to collect sablefish by dividing 100 by 20 to get a collection frequency of 5.

6. Starting at the beginning of skate 2, the Observer collects every 5th sablefish until a total of 20 sablefish have been collected.

7. The Observer weighs the 20 sablefish and uses the subsample weight to calculate the average sablefish weight.

Average Weight Calculations

On Fixed Gear vessels, all species in the tally sample MUST have an actual count. However, not all individuals need to be weighed. For some species, an average weight calculation can be applied.

Total Sample Wt. = <u>Wt. of subsample</u> X Total # in Tally Sample
 # In subsample

Tip* When doing an average weight calculation, count and weigh as many individuals as possible. At minimum, 15 individuals should be weighed and counted. For species that are caught in large quantities, count and weigh at least 50 individuals.

Using Delivery Weights for Average Weights of Tallied Individuals

Because fishers participating in the live fish market are extremely concerned about the condition of their fish, collecting retained individuals may not be possible. Observers can use delivery weights (fish tickets) to calculate the average weight of species on these vessels.

1. Tally ALL retained individuals by species for every haul.

2. Observe the weighing of the fish by species upon landing, if possible. If not, ask the skipper for a copy or look at the weights on the fish ticket.

3. Calculate average weight of species by:

$$\text{Avg. Species Weight} = \frac{\text{Landing weight of species (lbs)}}{\text{\# Of individuals of species caught during ENTIRE trip}}$$

4. For each haul, calculate the weight of retained species.

Species Wt by Haul = Avg. Species Wt X # of individuals caught in haul

Tip* Any time average weight calculations are used to determine a species weight, sample method 4 – Fixed Gear Sample should be used on the Species Composition Form. This can be confusing when delivery weights are used because all the fish for the trip are weighed. However, Sample Method 1 – Whole Haul refers to a haul

specific weighing of fish, which is not done in this case.

Weight Methods Applicable for Catch Categories on Fixed Gear Vessels

There are only four weight methods that can be used for catch categories on Fixed Gear Vessels. They are:

Weight method 13 – Tally Sample
Weight method 4 – Visual Estimate
Weight method 6 - Other
Weight method 9 – Pacific Halibut Length/Weight

Remember, no matter what weight method is used, actual counts must be obtained for all individuals in the sample.

Weight Method 13 – Tally Sample

This weight method is used for species that are counted AND an actual or extrapolated weight has been obtained.

Weight Method 4 – Visual Estimate

This weight method is used for species that have a count but ONLY a visual weight.

For example: Large skates will usually break the gangions when they leave the water. This means the Observer will not be able to get a weight for large skates and using an average weight from smaller skates would be biased. Therefore, taking a visual estimate of the weight is the best option.

Weight Method 6 – Other

This weight method should never be intentionally used. It creates confusion for end users and debriefers because it does not give an idea how the total catch was actually derived. If this method is used, document what happened in the Observer Logbook and on the paperwork.

Weight Method 9 – Pacific Halibut Length/Weight

This weight method is ONLY used for Pacific Halibut. Actual lengths or visually estimated lengths can be used.

Pacific Halibut

The International Pacific Halibut Commission (IPHC) manages the Pacific Halibut fishery. The IPHC sets the total allowable catch of Pacific halibut for both the United States and Canada. Pacific halibut (See Figure 5-15) are a prohibited species in most of the fisheries off Washington, Oregon, and California. It is illegal to retain Pacific Halibut on any vessel fishing in the waters off Washington, Oregon, and California unless:

- The vessel is participating the Limited Entry Sablefish fishery.
- The vessel is participating in a Pacific Halibut opener. These openers usually last only a day or two.

Figure 5 - 15: Pacific Halibut

Pacific Halibut in the Composition Sample

Pacific halibut are tallied at the same time as all other species but the method used for determining their weight is often different than for any other species. Pacific halibut are often too large to obtain an accurate weight with the scales provided and large individuals may not be brought on board the vessel at all. If the fish are small enough to weigh, it is preferred that individuals be collected for an average weight sample and applied to the tallied number. For situations where this is not possible, the IPHC has developed a length to weight table that lists approximate weights of Pacific halibut based on the length in centimeters (see Appendix J). It is acceptable to estimate the weight of Pacific Halibut in tally samples using this table. If actual lengths cannot be obtained, it is permissible to use visually estimated lengths.

The following suggestions will help with estimating the length of Pacific Halibut (See Figure 5-16):

- Measure the distance from the roller to weld marks on the side of the vessel or the waterline, if weather permits.
- Measure the distance between the gangions on the groundline and measure the length of the gangions themselves. On most longline vessels, the distance between the gangions and the length of the gangions are consistent. Under normal operations the Observer will be able to see the fish being pulled by the groundline and gangion. Estimate the length of the Pacific Halibut in reference to the length of groundline between the gangions or the length of the gangion itself.
- Use the length of the gaff or the pole gaff to compare to the lengths of the Pacific Halibut.

- Pre-measure the length of the longline trough, some Pacific Halibut will be brought on board either to be retained or by accident, having several marked measurements in the trough will allow the Observer to quickly estimate the length of any landed Pacific Halibut.

  After sampling a set, use the Length-to-Weight Table in Appendix J to determine proper weight. Multiply the number of Pacific Halibut for each length by the weight on the table. Sum the weights for all sizes to obtain the total weight of Pacific halibut in the sample.

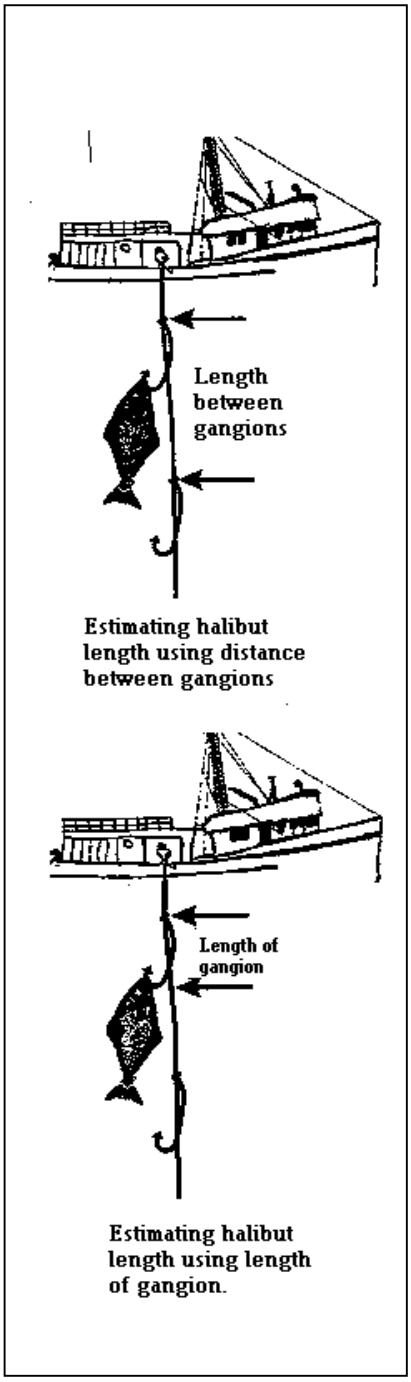


Figure 5 - 16: Visuals Length Estimates of Pacific Halibut

Unsampled Sets

Every set retrieved during a trip MUST have an OTC, even if it has not been sampled. For sets that are not sampled, employ a "sum of like sets" to determine OTC. Using a "sum of like sets" provides an estimation of catch based on sets from similar areas, depths, and times.

Never use the vessel's estimate for OTC on a longliner.

When estimating the OTC for an unsampled set, use more than one "like set" for the calculation. "Like sets" should be close in proximity, at the same depth, and of similar soak time as the unsampled set. In most circumstances, Observers will be able to use the sets just before and after their unsampled set. The lengths of the set or the number of hooks in the comparison sets do not need to be similar for the calculation of "like sets."

OTC of Unsampled set = Total wt of "like" set A + total wt of "like" set B x # hooks unsampled set
Total # of hooks in set A + total # of hooks in set B

Fixed Gear Catch Form Instructions

The Fixed Gear Catch Form (See Figure 5-17) is used to document sample weight and other catch information. A Catch Form should be completed for all hauls.

TIP* The "weight" column is filled out differently on Fixed Gear Catch Form than on the Trawl/Prawn Catch Form.

- **Haul Number** – Record the number of the haul.
- **Date** – Record the date as MM/DD/YY.
- **Trip Number** – Record the trip number generated by the database system.
- **Coast Guard Number** – Record the six or seven digit USCG vessel number if the vessel has one. **If the vessel does not have a USCG number, leave entry field blank.**
- **Catch #** - Number the catch categories consecutively, starting from 1 for each haul. The numbers on the paper Catch Form must match the numbers assigned by the database when data is entered.
- **R or D** – Record whether the catch category is from retained or discarded catch. Record with an R – Retained or D – Discarded.
- **Catch Category** – Record the catch category in capital letter using the 4-letter PacFin code. For a list of PacFin catch category codes, see Appendix E
- **Sample Weight** – Record the weight of the **tally sample** for the catch category in pounds.

- **Numbers of Fish – You MUST record** the total number of fish in the catch category if the Weight Method 4 – Visual Estimate or Weight Method 9 – Length/Weight conversion is used. Do not record the number of fish for weight method 13 – Tally Sample.

- **Hooks/Pots Sampled** – Record the number of hooks or pots tally sampled.

- **Weight Method** – Document the weight method used to estimate the catch category.

  4-Visual Estimate.

  6-Other

  9-Length/Weight Conversion (Pacific Halibut only).

  13 – Tally sample.

- **Catch Purity** – Record as P – Pure if the catch category is 95% or greater a single species or as M – Mixed if the catch category is less than 95% a single species.

- **Discard Reason** – Record the skippers/crews reason for discard for unsampled (no species composition sample taken) discarded catch categories only.

  1-Prohibited – Only Salmon, Pacific Halibut, and Dungeness crab.

  2-Size –High-graded fish.

  3-Market – Any market driven reason such as size (too big or small), no market, market price is too low, etc.

TIP* Species which are unlikely to be retained, such as eelpouts, sculpins, and grenadiers are given a reason for discard of "3".

4-Regulation – Any regulatory reason including size, over quota, etc.

5-Other – Document in comments actual reason for discard.

Tip* As a rule, invertebrates such as starfish, anemones, and sea pens are given a reason for discard of "5".

6-Drop-off – Any fish that would have been retained if it was landed. (Fish did not make it on boat because it fell off the line)

7-Predation – Any fish that would have been retained but was eaten by a predator:; such as a marine mammal, seabird, or sand fleas.

Tip* Look only at the primary reason for discard. For instance, if the vessel is not retaining Starry Flounder and one drops-off, do not record the reason of discard as drop-off. Even if it had made it on the vessel, the fish would not have been retained. This also applies to predated fish that drop-off. If a fish that would have been retained drops off because it's been predated, the reason for discard should be predation. (Even the fish made it

aboard it would not have been retained due to predation.)

- **Vessel Estimate –** This column is blank on fixed gear vessels.

- **Comments** – Document anything important about each category.

- **Keypunch Checks** – These are required field for Sample Weight, Numbers of fish, and Numbers of Hooks/Pots columns. Sum up the entries in each column and place the total in the corresponding keypunch box at the bottom of the form.

Haul # | | **FIXED GEAR CATCH FORM*** Page ____ of ____

Date | | | | | | | Trip Number | | | | | | USCG # | | | | | | | |

Catch #	R or D	Catch Category	Sample Weight	#'s of Fish Req. for wt. methods 4, 6, 9	# Hooks/Pots sampled by catch category	Weight Method	Catch Purity	Discard Reason	Vessel Estimate	Comments
Keypunch Checks										

*Gear Types 6, 7, 8, 9, 10, 15, 16

January 2004

Fixed Gear Catch Form v. 4

Figure 5 - 17: Fixed Gear Catch Form

IV. Collecting and Documenting Species Composition

Sample Methods when Tally Sampling

On fixed gear vessels, only catch categories with *Weight Method* 13 – Tally Sample will have a species composition.

Method for Species Composition Sampling

There are two sample methods for species composition sampling on fixed gear vessels.

- ***Sample Method 1*** **– Whole Haul**
  If the Observer weighed 100% of the individuals in the catch category, Sample Method 1 – Whole Haul is used.

- ***Sample Method 4*** **– Fixed Gear Sample**
  If less than 100% of the individuals in the catch category are weighed, Sample Method 4 – fixed gear sample is used.

IMPORTANT!!

Discarded and retained individuals are always in separate catch categories. Within either the discarded or retained portion of the tally sample:

- If **every** individual is weighted then all species are placed in one catch category and the sample method on the Species Composition Form is 1 – Whole Haul.

- If there are individuals where weights must be visually estimated or Pacific halibut for which length/weight conversions are done, these individuals are placed in their own catch categories and **are not** recorded on the Species Composition Form.

- If only a portion of the individuals of **any** species are weighed (i.e. only 5 of 10 skates are weighed) and an average weight is used to calculate total weight of skates in the sample then all species for which actual or extrapolated sample weights have been obtained are placed in the same catch category and the Sample Method on the Species Composition Form is 4 – Fixed Gear Sample.

Species Composition Form Instructions

The species composition information collected is record on the Species Composition Form (See Figure 5-18).

- **Haul Number** – Record the number of the haul that the sample came from.
- **Date** – Record the date as MM/DD/YY.
- **Trip Number** – Record the trip number generated by the database system.
- **Coast Guard Number** – Record the six or seven digit USCG vessel number if the vessel has one. **If the vessel does not have a USCG number, leave entry field blank.**
- **Catch #** - Record the number that corresponds to the catch category on the Catch Form.
- **Sample Method** – Record the method used to sample the catch category.

  1 – Whole haul.

  4 – Fixed Gear.

- **# Of Baskets** – This field is blank on fixed gear vessels.

- **Catch Category** – Record in capitol letters the catch category sampled using the 4-Letter PacFin code.

- **KP Weight and KP Number** – Sum up the total weight of all species in the catch category sample and place the total weight in the Keypunch (KP) Weight box. Sum up the total number of all species in the catch category sample and place the total number in the Keypunch (KP) Number box.

Tip* Check to be sure the KP Weight on the Species Composition form is the same as the Catch Category Sample Weight on the Catch Form!! (If not, there is a problem).

- **R or D** – Record whether the catch category sampled was **R** – Retained or **D** – Discarded.

- **Species** – Record the common name of the species in the sample. This column must be filled in with the species name. Do not simply enter the species code! The common name listed on the paperwork must match the common name used in the database. See Appendix A - D for a list of species.

- **Species Code** – Record the species code number of the corresponding species. This can be done prior to entering and not on deck. See Appendix A - D for a list of species and species codes.

- **Sample Weight** – Record the total weight of the species in the sample (can be extrapolated).

- **Fish Number** – Record the number of fish of each species in the sample (Can NOT be extrapolated).

- **Reason for Discard** – Record the skipper's/crew's reason of discard for each discarded species.

  1-Prohibited – Only Salmon, Pacific Halibut, and Dungeness crab.

  2-Size – High-graded fish.

  3-Market – Any market driven reason such as size (too big or small), no market, market price is too low, etc.

  Tip* Species which are unlikely to be retained, such as eelpouts, sculpins, and grenadiers are given a reason for discard of "3".

  4-Regulation – Any regulatory reason including size, over quota, etc.

  5-Other – Document in comments actual reason for discard.

  Tip* As a rule, invertebrates such as starfish, anemones, and sea pens are given a reason for discard of "5".

  6-Drop-off – Any fish that would have been retained if it was landed (fish did not make it on boat because if fell off the line).

  7-Predation – Any fish that would have been retained but was eaten by a predator:; such as a marine mammal, seabird, or sand fleas.

  Tip* Look only at the primary reason for discard. For instance, if the vessel is not retaining Starry Flounder and one drops-off, do not record the reason of discard as drop-off. Even if

it had made it on the vessel, the fish would not have been retained. This also applies to predated fish that drop-off. If a fish that would have been retained drops off because it's been predated, the reason for discard should be predation (even the fish made it aboard it would not have been retained due to predation.).

- **Basket Weight and Number** – Use this column on deck for species with multiple weights. These columns are not required. Be sure to fill the "Sample Weight" column in with the total weight of the species in the sample only!

Haul # | | | **SPECIES COMPOSITION FORM** | Page ____ of ____

Date | | | | | | | Trip Number | | | | | | USCG # | | | | | | | |

Catch #	Catch Category	Sample Method	Basket #	KP Weight / KP Number	R or D	Species	Species Code	**Sample Weight**	**Fish #**	Discard Reason	Basket Weight	#	Basket Weight	#

Method : **1**-Whole haul species **2**-Single basket **3**-Multiple basket **4**-Fixed Gear Sample

Reason for discard: **1**-Prohibited **2**-Size **3**-Market **4**-Regulation **5**-Other **6**-Drop-off 7 - Predation

Species Composition Form v.3
January 2004

Figure 5 - 18: Species Composition Form

Discard That Cannot Be Attributed to a Specific Haul

On rare occasions, a vessel will discard fish from the hold. This happens if market conditions change during a trip or if they are catching larger fish that are worth more money. Record discard that cannot be attributed to a specific haul on the Trip Discard Form.

Trip Discard Form Instructions

The Trip Discard Form is not entered into the database system. Document the information from the Trip Discard Form (See Figure 5-19) in the Trip Comments on the Trip Page.

- **Trip Number** – Record the trip number generated by the database system.
- **Coast Guard Number** – Record the six or seven digit USCG vessel number if the vessel has one. **If the vessel does not have a USCG number, leave entry field blank.**
- **Date** – Document the month and day that the trip discard took place.
- **Time** – Document the time, in Pacific Standard Time, that the trip discard took place.
- **Species** – Document the species that was discarded.
- **Weight** – Document the weight, in pounds, of species discarded.
- **# of Fish** – Document the number of fish discarded.

- **Weight Method** - Document the weight method used to estimate the species weight.

  1-Actual Weight

  2-Bin/Trawl Alley Estimate

  3-Basket Volume Determination

  4-Visual Estimate

  5-OTC-Retained

  6-Other

  7-Vessel Estimate

  8-Extrapolation

- **Discard Reason** - Record the skipper's/crew's reason of discard for each species.

  1-Prohibited – Only Salmon, Pacific Halibut, and Dungeness crab.

  2-Size – High-graded fish.

  3-Market – Any market driven reason such as size (too big or small), no market, market price is too low to retain.

  4-Regulation – Any regulatory reason including size, over quota, etc.

  5-Other – Document in comments actual reason for discard.

  7 – Predation – Caught fish that are eaten by any predator including marine mammals, seabirds, or sand fleas.

- **Comments** – Document any additional information that is important.

Trip Discard Form Page ____ of ____

Trip Number | | | | | | USCG # | | | | | | | |

Date		Time	Species	Weight	# of Fish	Weight Method	Discard Reason	Comments
Month	Day							

Trip Discard Form v.2 January 2004

Figure 5 - 19: Trip Discard Form

V. Examples

Longline Example

Official Total Catch Calculations

Gear Units Sampled: 15 | Average Soak Time/Gear Unit: N/A | # hooks/gear unit: 136

Retained			Discarded	
7 @ 57.82 lbs 8 @ 71.96 lbs 10 @ 86.91 lbs 6 @ 53.84 lbs 8 @ 61.43 lbs 8 @ 72.34 lbs 7 @ 52.16 lbs	562	Sable	| (Drop-off)	
		Arrowtooth	15	15 @ 77.0lbs (Market)
		Starfish	11	11 @ 10.23 lbs
14 @ 55.0	14	Red-Banded	|| (Drop-off)	
		Spiny Dog	51	15 @ 60.74 lbs (Market)
2 @ 5.5lbs	3	Shortspine	4 (Drop-off)	
		Skate (Visual)	40 30 20 60 20 50 40 45 30 40 20 30	(Market)
		P. halibut (visual length)	30 4 40 7 II 50 II 60 I 80 11 I 100 III 110 II	

Total Hooks in Set = 15 skates X $\frac{136 \text{ Hooks}}{\text{Skate}}$ = 2040 Hooks

OTC = Retained + Discarded = 4813.82 lbs + 359.74 lbs + 406.87 lbs + 425 lbs = 6005.43 lbs

Haul # 0 1

FIXED GEAR CATCH FORM*

Page 1 of 2

Date 0 8 2 3 0 2 Trip Number 1 7 6 USCG # 1 0 6 8 3 6 1

Catch #	R or D	Catch Category	Sample Weight	#'s of Fish Req. for wt. methods 4, 6, 9	# Hooks/Pots sampled by catch category	Weight Method	Catch Purity	Discard Reason	Vessel Estimate	Comments
1	R	ZMIS	4813.82		2040	13	M			
2	D	ZMIS	359.74			13	M			
3	D	PHLB	406.87	41		9	P	1		
4	D	SKAT	425	12	2040	4	P	3		
Keypunch Checks			6005.43	53	8160					

*Gear Types 6, 7, 8, 9, 10, 15, 16

January 2004

Fixed Gear Catch Form v. 4

Haul # 0 1

SPECIES COMPOSITION FORM

Date 0 8 2 3 0 2 Trip Number 1 7 6 USCG # 1 0 6 8 3 6 1

Catch #	Catch Category	Sample Method	Basket #	KP Weight / KP Number	R or D	Species	Species Code	Sample Weight	Fish #	Discard Reason	Basket Weight	#	Basket Weight	#
1	ZMIS	4		4813.82 / 579	R	Sablefish	203	4750.57	562					
						Redbanded RF	308	55.00	14					
						Shortspine Thornyhead	350	8.25	3					
2	ZMIS	4		359.74 / 92	D	Sablefish	203	8.45	1	6				
						Arrowtooth Flounder	141	112.93	22	3				
						Starfish	20	10.23	11	5				
						Redbanded RF	308	7.86	2	6				
						Spiny Dogfish	66	206.52	51	3				
						Shortspine Thornyhead	350	13.75	5	6				

Method : **1**-Whole haul species **2**-Single basket **3**-Multiple basket **4**-Fixed Gear Sample

Reason for discard: **1**-Prohibited **2**-Size **3**-Market **4**-Regulation **5**-Other **6**-Drop-off 7 - Predation

Species Composition Form v.3
January 2004

Species Composition Measurements and Calculations

R or D	Catch Category	Density Samples	Measurements, Formulas, and Calculations	Total Weight
R	ZMIS 1		Sablefish Aver Weights 456.46 lbs = 8.452962962 lbs/fish 54 fish SABL wt - 562 fish X 8.452962962 lbs = 4750.565184 lbs fish Shortspine Thornyhead Ave Wts 5.5 lbs = 2.75 lbs/fish 2 fish SSPN wt = 3 fish X 2.75lbs/fish = 8.25 lbs	SABL 562 @ 4750.57 SSPN 3 @ 8.25
D	ZMIS 2		SABL weight (use retained ave wt) 8.452962962 lbs/ fish X 1 fish = 8.452962962 lbs Arrowtooth Ave Wt 77.00lbs = 5.133333333 lbs/fish 15 fish ARTH wt = 22 fish X 5.133333333 lbs/fish = 112.9333333 lbs	SABL 1 @ 8.45 ARTH 22 @ 112.93 Redband 2 @ 7.86
			Redbanded RF weight (use retained ave wt) 55.0 lbs = 3.928571428 lbs/fish 14 fish Redbanded wt = 2 fish X 3.928571428 lbs/fish = 7.857142856 lbs	Spiny Dog 51 @ 206.52 SSPN 5 @ 13.75
		SKATE visuals 40 + 60 + 40 + 40 + 30 + 20 + 45 + 20 + 20 + 50 + 30 + 30 = 425 lbs	Spiny Dogfish Ave Wt 60.74 lbs = 4.049333333 lbs/fish 15 fish DSRK wt = 51 fish X 4.049333333 lbs/fish = 206.5159999 lbs Shortspine Thornyhead (used retained ave wt) 2.75 lbs/fish X 5 fish = 13.75 lbs	Skate = 12 @ 425.00
		PHLB 30 - 5 X .57 lbs = 2.85 lbs 40 - 12 X 1.43 lbs = 17.16 lbs 50 - 2 X 2.95 lbs = 5.90 lbs 60 - 1 X 5.31 lbs = 5.31 lbs 80 - 16 X 13.51 lbs = 216.16 lbs 100 - 3 X 27.87 lbs = 83.61 lbs 110 - 2 X 37.94 lbs = 75.88 lbs	PHLB wt = 41 @ 406.87 lbs	

Pot Example

Official Total Catch Calculations

Gear Units Sampled: 12 of 25

Average Soak Time/Gear Unit: N/A

hooks/gear unit:

Retained			Discarded	
10 @ 68.49 lbs 10 @ 68.07 lbs 10 @ 72.51 lbs	98	Sable	66	11 @ 49.11 lbs 3 @ 13.66 lbs 4 @ 17.83 lbs
		Grenadier		7 @ 27.85 lbs (Market)
		Tanneri Crabs		11 @ 6.42 lbs 8 @ 4.81 lbs (Market)
		Sea Whip		1 @ .33 lbs
2 @ 5.5lbs		Starfish		2 @ .81 lbs

OTC = Sum of Catch Categories X $\frac{\text{\# of pots in set}}{\text{\# of pots sampled}}$

OTC = 1025.19 lbs X $\frac{25 \text{ pots}}{12 \text{ pots}}$ = 2135.8125 lbs

Haul # | | |

FIXED GEAR CATCH FORM*

Page 1 of 2

Date | | | | | | | Trip Number | | | | | | USCG # | | | | | | | |

Catch #	R or D	Catch Category	Sample Weight	#'s of Fish Req. for wt. methods 4, 6, 9	# Hooks/Pots sampled by catch category	Weight Method	Catch Purity	Discard Reason	Vessel Estimate	Comments
1	R	SABL	682.96		12	13	M			
2	D	ZMIS	342.23		↓	13	M			
Keypunch Checks			1025.19		24					

*Gear Types 6, 7, 8, 9, 10, 15, 16

January 2004

Fixed Gear Catch Form v. 4

Haul # 0 1

SPECIES COMPOSITION FORM

Date 0 8 2 3 0 2 Trip Number 1 7 6 USCG # 1 0 6 8 3 6 1

Catch #	Catch Category	Sample Method	Basket #	KP Weight / KP Number	R or D	Species	Species Code	Sample Weight	Fish #	Discard Reason	Basket Weight	#	Basket Weight	#
1	ZMIS	4		682.96 / 98	R	Sablefish	203	682.96	98					
2	ZMIS	4		342.23 / 112	D	Grenadier	80	23.87	6	3				
						Sablefish	203	295.53	66	2				
						Tanneri T. Crab	18	21.28	36	3				
						Sea Whip	58	.33	1	5				
						Starfish	20	1.22	3	5				

Method : **1**-Whole haul species **2**-Single basket **3**-Multiple basket **4**-Fixed Gear Sample

Reason for discard: **1**-Prohibited **2**-Size **3**-Market **4**-Regulation **5**-Other **6**-Drop-off 7 - Predation

Species Composition Form v.3
January 2004

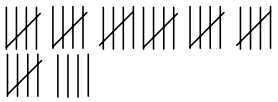
Species Composition Measurements and Calculations

R or D	Catch Category	Density Samples	Measurements, Formulas, and Calculations	Total Weight
R	ZMIS 1		Sablefish Ave Wts 209.07 lbs = 6.969 lbs/fish 30 fish SABL wt - 98 fish X 6.969 lbs = 682.962 lbs fish	SABL 98 @ 682.96
D	ZMIS 2		Sable Ave Wts 80.60 lbs = 4.477777777 lbs/fish 18 fish SABL wt = 66 fish X 4.477777777 lbs/fish = 295.5333332 lbs Grenadier Ave Wts 27.85 lbs = 3.978571428 lbs/fish 7 fish	SABL 66 @ 295.53 GREN 6 @ 23.87
			GREN wt = 6 fish X 3.978571428 lbs/fish = 23.87142856 lbs Tanneri T. Crab Ave Wts 11.23 lbs = .591052631 lbs/fish 19 fish TCRB wt = 36 fish X .591052631 lbs/fish = 21.27789471 lbs	Tanneri 36 @ 21.28 Starfish 3 @ 1.215
			Starfish Ave Wts .81 lbs = .405 lbs/fish 2 fish STAR wt = 3 fish X .405 lbs/fish = 1.215 lbs	

Stick Gear Example

Official Total Catch Calculations

10 sticks pulled multiple times

Gear Units Sampled 

Average Soak Time/Gear Unit: 30 minutes

hooks/gear unit: 3

Set: 36 14.467 125 44.114 0935 Up: 36 14.489 125 44.138 1250

Retained		Discarded
5.0 lbs, 2.5 lbs, 2.5 lbs, 3.0 lbs, 3.5 lbs, 2.75 lbs, 2.75 lbs, 2.0 lbs	Cabezon	1.75 lbs, 2.0 lbs, 4.0 lbs, 1.25 lbs (regs)
1.75 lbs, 1.0 lbs	Kelp Greenling	
1.25 lbs	Black and Yellow RF	.75 lbs, 1.5 lbs, .75 lbs, .75 lbs, .75 lbs, .75 lbs, .75 lbs (regs)
3.0 lbs, 3.25 lbs, 2.25 lbs, 2.25 lbs, 3.75 lbs, 1.89 lbs	Grass RF	1.0 lbs, 2.6 lbs (regs)
1.0 lbs	Kelp RF	
	Swell Shark	4.5 lbs
	Blue RF	2.7 lbs, .89 lbs, 2.0 lbs, 3.3 lbs (market)
	Lingcod	12.0 lbs, 9.0 lbs (regs)
	Gopher	.50 lbs, 2.1 lbs (regs)
	Sunstar	1.0 lbs, .5 lbs, .5 lbs

Total Hooks in Set = 39 sticks X $\frac{3 \text{ hooks}}{\text{stick}}$ = 117 hooks

OTC = Retained + Discarded = 45.39 lbs + 57.59 lbs = 102.98 lbs

Haul # | | |

FIXED GEAR CATCH FORM*

Page 1 of 2

Date | | | | | | | Trip Number | | | | | | USCG # | | | | | | | |

Catch #	R or D	Catch Category	Sample Weight	#'s of Fish Req. for wt. methods 4, 6, 9	# Hooks/Pots sampled by catch category	Weight Method	Catch Purity	Discard Reason	Vessel Estimate	Comments
1	R	ZMIS	45.39		117	13	M			
2	D	ZMIS	57.59		↓	13	M			
Keypunch Checks			102.98		234					

*Gear Types 6, 7, 8, 9, 10, 15, 16

January 2004

Fixed Gear Catch Form v. 4

Haul # ____

SPECIES COMPOSITION FORM

Date ____ Trip Number ____ USCG # ____

Catch #	Catch Category	Sample Method	Basket #	KP Weight / KP Number	R or D	Species	Species Code	Sample Weight	Fish #	Discard Reason	Basket Weight	#	Basket Weight	#
1	ZMIS	1		45.39 / 18	R	Cabezon	689	24.0	8					
						Kelp Greenling	392	2.75	2					
						Black n Yellow RF	355	1.25	1					
						Grass RF	365	16.39	6					
						Kelp RF	369	1.0	1					
2	ZMIS	1		57.59 / 26	D	Cabezon	689	9.0	4	4				
						Black n Yellow RF	355	6.0	7	4				
						Grass RF	365	3.6	2	4				
						Swell Shark	587	4.5	1	3				
						Blue RF	316	8.89	4	3				
						Lingcod	603	21.0	2	4				
						Gopher RF	364	2.6	2	4				
						Sunstar	24	2.0	3	5				

Method : **1**-Whole haul species **2**-Single basket **3**-Multiple basket **4**-Fixed Gear Sample

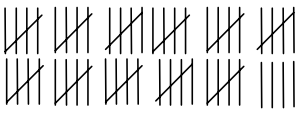
Reason for discard: **1**-Prohibited **2**-Size **3**-Market **4**-Regulation **5**-Other **6**-Drop-off 7 - Predation

Species Composition Form v.3
January 2004

Rod and Reel Example

Official Total Catch Calculations

Gear Units Sampled



Average Soak Time/Gear Unit:

hooks/gear unit: 6

Set: 38 21.59 120 16.478 0730 50 FEET (8 fathoms)
Up: 38 21.79 120 16.482 1030

Retained		Discarded		
	Black and Yellow RF	2 @ 1.5 lbs 1 @ .75 lbs 1 @ .75 lbs 1 @ .75 lbs	1 @ .75 lbs 2 @ 1.75 lbs 1 @ .75 lbs 1 @ .75 lbs	(regs)
	Vermillion RF			
	Gopher RF			
	Lingcod			
	Cabezon	1 @ 2.75 lbs 1 @ 3.75 lbs 1 @ 3.50 lbs 1 @ 2.00 lbs 1 @ 4.00 lbs	1@ 2.25 lbs 1 @ 2.25 lbs 1 @ 4.50 lbs 2 @ 6.50 lbs 1 @ 7.00 lbs	(regs)
	Kelp Greenling	2 @ 1.75 lbs 1 @ 1.25 lbs 1 @ 1.00 lbs 1 @ 1.50 lbs 1 @ 1.00 lbs		(regs)

Total Hooks in Set = 59 rods X $\frac{6 \text{ hooks}}{\text{stick}}$ = 354 hooks

OTC = Retained + Discarded = 40.23 lbs + 52.75 lbs = 92.98 lbs

Haul # | | |

FIXED GEAR CATCH FORM*

Date | | | | | | | Trip Number | | | | | | USCG # | | | | | | | |

Catch #	R or D	Catch Category	Sample Weight	#'s of Fish Req. for wt. methods 4, 6, 9	# Hooks/Pots sampled by catch category	Weight Method	Catch Purity	Discard Reason	Vessel Estimate	Comments
1	R	ZMIS	40.23		354	13	M			
2	D	ZMIS	52.75		↓	13	M			
Keypunch Checks			92.98		708					

*Gear Types 6, 7, 8, 9, 10, 15, 16

January 2004

Fixed Gear Catch Form v. 4

Haul # | | |

SPECIES COMPOSITION FORM

Date | | | | | | | Trip Number | | | | | USCG # | | | | | | | |

Catch #	Catch Category	Sample Method	Basket #	KP Weight / KP Number	R or D	Species	Species Code	**Sample Weight**	**Fish #**	Discard Reason	Basket Weight	#	Basket Weight	#
1	ZMIS	4		40.23 / 21	R	Black N Yellow RF	355	11.05	12					
						Vermillion RF	331	5.8	2					
						Gopher RF	364	2.38	3					
						Lingcod	603	21.0	4					
2	ZMIS	1		52.75 / 27	D	Black N Yellow RF	355	7.75	10	4				
						Cabezon	689	38.5	11	4				
						Kelp Greenling	392	6.5	6	4				

Method : **1**-Whole haul species **2**-Single basket **3**-Multiple basket **4**-Fixed Gear Sample

Reason for discard: **1**-Prohibited **2**-Size **3**-Market **4**-Regulation **5**-Other **6**-Drop-off 7 - Predation

Species Composition Form v.3
January 2004

Species Composition Measurements and Calculations

R or D	Catch Category	Density Samples	Measurements, Formulas, and Calculations	Total Weight
R	ZMIS 1	Average Weights for Retained from Fish Ticket Weights	Fish Ticket Weights Black N Yellow: 35 lbs (Total of 38 fish caught on trip) Vermillion: 14.5 lbs (Total of 5 fish caught on trip) Gopher: 27 lbs (Total of 34 fish caught on trip) Lingcod: 21 lbs (Total of 4 fish caught on trip)	
			Black N Yellow Ave Wts 35 lbs = .921052631 lbs/fish 38 fish BNY wt = 13 fish X .921052631 lbs/fish = 11.05263157 lbs	BNY 12 @ 11.05
			Vermillion Ave Wts 14.5 lbs = 2.90 lbs/fish 5 fish VERM wt = 2 fish X 2.90 lbs/fish = 5.8 lbs	Verm 2 @ 5.8
			Gopher Ave Wts 27 lbs = .794117647 lbs/fish 34 fish GOPH wt = 3 fish X .794117647 lbs/fish = 2.382352941 lbs	GOPH 3 @ 2.38

Chapter 6

Biological Sampling

Focus Questions:

- What are the biological sampling priorities for fish?
- Which fish should viabilities be collected from?
- What biological information is collected from fish?
- What physical specimens are collected from fish?

Chapter Outline

I. Introduction

II. Data Collection Priorities

III. Biological Specimens Sampling

IV. Data Collection Procedures

V. Data Collection Forms

I. Introduction

Observer programs provide an excellent way to collect biological specimen information for use by fisheries biologists and stock assessment analysts. Observers in the WCGOP are asked to collect fish lengths, weights, sexes, otoliths, viabilities, tags, and scales in an effort to improve understanding of various fish stocks.

Fish lengths, sexes and otoliths are used to determine the relative abundance of fish year classes and the occurrence of the various year classes in commercial fishing landings. These specimen collections are also used to estimate the sexual composition of fish year classes, determine differential growth rates between sexes, and to provide length to age ratios for use in stock assessments.

Pacific halibut viabilities (injury data) are used to assess the mortality rate of Pacific halibut due to commercial fishing. The injury data collected by Observers are analyzed by staff from the International Pacific Halibut Commission (IPHC) and used to estimate yearly mortality rates.

Information from tagged fish and crabs are used by a variety of educational institutions, state agencies, and federal agencies. Fish are tagged to study fish migration, stock separation, fishing related mortality, and population dynamics. Data from tagged fish is vital to the success of these studies.

Scales are collected from salmon to verify species identification. Salmon are often extremely difficult to identify when caught either because of damage incurred during gear retrieval or strange coloration due to the proximity of spawning.

II. Data Collection Priorities

Due to potential data collection time constraints, Observers are asked to prioritize the collection of biological specimen information by species and information taken. In addition, biological sampling should only be undertaken after collecting comprehensive catch and species composition information. Biological Specimens are taken from DISCARD only.

Biospecimen data collection in order of priority:

1. Tagged Fish
    - Collect length, weight, sex, and tag.
    - Collect otoliths if appropriate (see details below).
2. Salmon
    - Collect length and sex.
    - Collect snout if adipose fin is missing (tagged salmon).
    - If possible, collect weight.
    - Collect scales if appropriate (see details below).
3. High Priority Rockfish Species and Lingcod
    - Collect length and sex.
    - If possible, collect weight and otoliths.
4. Pacific Halibut
    - Collect length and viability.
    - If possible, collect weight.

Data Collection from Tagged Fish

Sablefish and salmon are the most commonly encountered tagged fish. Occasionally tagged Pacific cod, Pacific halibut, California halibut, pollock, shortspine thornyhead and some rockfish species may be seen as well.

Collect the following data from tagged fish:

1. Length
2. Sex
3. Otoliths - Except for sablefish with blue spaghetti tags and salmon. In these cases, collect the entire snout.
4. Weight
5. Tag – Collect either the external tag or salmon snout.

Data Collection from Salmon

Salmon are difficult to identify correctly and may be tagged internally or externally. Watch for missing adipose fins which mark fish with internal tags. Scales are collected both to verify species identification and from all tagged salmon.

Collect the following data from salmon:

1. Length
2. Sex
3. Weight

4. Scales

    - From the first five fish of each salmon species encountered during your first contract and the first two fish from each subsequent contract.
    - Whenever species identification is in doubt.
    - When an external tag or tagged snout is collected.

5. Snout if the adipose fin is missing.

Data Collection From High Priority Rockfish Species and Lingcod

There are eleven high priority species (mostly rockfish) on the west coast about which limited biological information has been collected to date. Stock assessment analysts have asked that WCGOP Observers focus on collecting length, sex and otolith information from these species.

Following is the list of high priority species in order of data collection priority:

1. Canary Rockfish
2. Yelloweye Rockfish
3. Bocaccio Rockfish**
4. Cowcod**
5. Pacific Ocean Perch
6. Lingcod
7. Dark-blotched Rockfish
8. Widow Rockfish
9. Rougheye Rockfish
10. Shortraker Rockfish
11. Silvergrey Rockfish

Priority only for fish collected South of 40°10′ (Cape Mendocino)

Collect the following data from high priority species:

1. Length
2. Sex (except for fish being released alive).
3. Otoliths (except for lingcod, Bocaccio rockfish and rockfish species being released alive).
4. Weight if otoliths are taken.

Collect high priority fish for sampling based on the following guidelines:

1. Collect data only from discarded fish.
2. Collect fish in order of priority.
3. Collect data from all discarded high priority species in the species composition sample if possible.
4. If there is a mixture of many high priority fish in the species composition sample, collect 5 fish from each species in order of priority for a minimum of 20 fish total per haul.

Data Collection from Pacific Halibut

Pacific halibut are frequently immediately sorted from the catch and returned alive to the sea. Collect lengths and viabilities from the discarded Pacific halibut as the crew is sorting.

Collect the following data from discarded Pacific halibut:

1. Length (do not estimate).
2. Viability
3. Weight if possible.

III. Biological Specimen Sampling

Biological information is collected on individual fish for a variety of reasons. In some instances it is pertinent that the information be collected in a random fashion while in others, such as with tagged fish, information is, of necessity, collected in a non-random fashion.

There are four sample methods for biological sampling. The primary factors used to differentiate these methods are:

1. Whether the individuals used for biological sampling were within the species composition sample.

2. Whether the individuals used for biological sampling were randomly selected.

Biological Sampling Methods

Sample Method 6 – Outside and Nonrandom

- Individuals are not part of a species composition sample and have NOT been randomly selected.

- Use this method for tagged fish that have been collected opportunistically during a haul/set.

Sample Method 7 – Outside and Random

- Individuals are not part of a species composition sample and have been randomly selected.

- Use this method for Pacific halibut when lengths/viabilities have been taken for randomly selected individuals from the haul/set but there was not a species composition sample because actual weights of halibut were not obtained.

Sample Method 8 – Inside and Nonrandom

- Individuals are part of a species composition sample and have NOT been randomly selected.
- Use this method for tagged fish that have been collected opportunistically from a species composition sample.

Sample Method 9 – Inside and Random

- Individuals are part of a species composition sample and have been randomly selected.
- Use this method when taking biological data from all individuals or from randomly selected individuals of a particular species within a species composition sample.

Random Sampling

In general, individuals used for biospecimen sampling should be selected from within a species composition sample. Only on rare occasions is it necessary to create an independent random sample for biological specimens.

Random Sampling Within a Species Composition Sample

Selecting individuals for biological sampling from within a species composition sample is encouraged. When collecting individuals from inside a species composition sample, all of the individuals of a single species make up a single population (see Chapter 3 for a review of Random Sampling Theory). There are two ways that a random sample can be taken from a population.

- **All** individuals in the population are selected.
- A random subsample of the individuals in the population is selected.

Subsamples may be taken using any one of the following random sampling methods.

- Spatial – Randomly select a unit of gear or an area (portion of deck or bin, specific basket) to collect individuals from.

- Temporal – Randomly select a point in time to collect individuals.

- Systematic – Select a random start point (spatial or temporal) and take individuals at set intervals. In order to use a systematic system you must know approximately how many of the target species are in the population.

Example:

1. The crew on a trawler is sorting out a scupper and the Observer is whole hauling the discard.

2. The Observer estimates that 100 Pacific Ocean Pearch (POP) will be discarded. There are no other priority species present.

3. The Observer refers to the Biological Sampling chapter in his manual and verifies that he needs to take sexed lengths from 20 of the discarded POP.

4. The Observer decides to do a systematic subsample of the POP within his species composition sample.

5. The Observer divides the estimated number of POP in the haul by the number he needs to sample (100 /20 = 5). This tells him he need to collect 1 fish out of every 5.

6. The Observer randomly selects a number between 1 and 5. This will be the first POP collected. He selects 5.

7. The Observer collects the fifth POP the crew sorts and every 5th POP thereafter (5, 10, 15, 20, 25…) for biological specimen sampling.

8. The POP sexed lengths will be recorded on the Length Frequency form with a sample method of 9 – Inside and Random.

Random Sampling Outside a Species Composition Sample

Selecting individuals for biospecimen sampling from outside a species composition sample should be a rare event. Normally this type of sampling is only used in two circumstances.

- When biological information is impossible to collect during the tally sampling period.

- When weighing Pacific halibut is not possible.

If biological information is being collected from individuals that need to be released alive, it may not be possible to accurately tally sample and collect the needed individuals for biological information at the same time. In this circumstance, the only option is to collect individuals for biological specimens during a non-tally period. A random sampling frame should be designed where all selected individuals are sampled.

Often lengths and viabilities will be collected from Pacific halibut but actual weights will not be taken, instead the length /weight conversion table will be used to obtain weights. In this circumstance, the PHLB (Pacific Halibut) catch category will have a biospecimen sample without an associated species composition.
When randomly collecting individuals from outside a species composition sample use the following guidelines:

- Size the sample appropriately for the number of individuals needed.
- Select all individuals in the population.
- Do not subsample the population.

Example:

1. The Observer on a longline vessel is tallying skates 1-10 and 21-30 of a 40 skate set.
2. There are fish on almost every hook so it is impossible for the Observer to look away even for a minute to collect biological information.
3. The Observer needs to collect lengths and viabilities on Pacific halibut. Viabilities need to be taken immediately as normal crew handling is to release the fish right away and viabilities must be taken at normal point of release.
4. The Observer determines during the initial tally period that approximately 10 Pacific halibut are being caught on every skate.
5. The Observer calculates that during the non-tally periods (20 skates) 200 Pacific halibut will be caught. He wants to take lengths and viabilities from 20.
6. The Observer divides the estimated number of Pacific halibut that will be caught during the non-tally period by the number he wants to take data from (200/20 = 10). This tells him he needs to sample 1 fish out of every 10.
7. The Observer randomly selects a number between 1 and 10. He selects 2. This means that the second Pacific halibut caught will be his first sample fish.

8. The Observer asks the gaff-man to land the second Pacific halibut that comes up during the non tally period. He records the length and viability of this fish.

9. The Observer then asks the gaff-man to land every 10th Pacific halibut caught thereafter and takes lengths and viabilities on all of them (the population in this case is every 10th fish, beginning with fish #2).

10. The viabilities will be recorded on the Biological Specimen form with a sample method of 7 – Outside and Random.

Non-Random Sampling

The **only** time that fish should be selected in a non-random fashion is when biological information is being collected from tagged fish. Tagged fish may be taken from either inside or outside of a species composition sample.

A tagged fish has been collected non-randomly if either of the following apply:

- The tagged fish is NOT part of a species composition sample or a random sample taken from outside the species composition.
- The tagged fish is within a species composition sample but is NOT part of a random sample for biological specimens.

IV. Data Collection Procedures

Fish lengths, sexes, and otoliths are collected from a wide variety of species. While the information gathered is the same for all species, the collection procedures often vary. It is important to utilize the appropriate procedure for each species to insure accurate data collection.

Figure 6- 1: Rockfish Length

Lengthing Fish

Data Collection Guidelines

1. Collect lengths for tagged fish.
2. Collect lengths for Pacific halibut when viabilities are being taken.
3. Collect lengths for salmon.
4. Collect lengths for high priority species such as rockfish or lingcod.

Preparing to Measure Fish

Before you begin collecting fish for length measurements, set up an area to measure fish. You will need to use or create a "table" large enough to lay a fish on the plastic length strip. If there is no table present, use the NMFS aluminum board, baskets, deck bin boards or the deck as a table.

Selected species should be collected in a random fashion for length measurements and should only be collected from discarded species.

Measuring Fish

Fork length is the fish length measurement method used by the WCGOP and other NOAA Fisheries researchers. Fork

length is the length from the tip of the snout or jaw (whichever sticks out most) to the end of the middle rays of the caudal fin (See Figure 6-1 and 6-2). The only exception to this rule is grenadier length, which is measured from the snout to the insertion of the anal fin.

You will be given plastic measuring strips marked at centimeter increments. The first line printed on the strip is 4.5 cm, and the space between that line and the next line is .5 cm. Check your plastic strip on both sides to insure that the first line is actually located 4.5 cm from the end of the strip. Sometimes the manufacturer has cut the strip incorrectly. Notice that the 10-centimeter increments are not marked with a number. This is to facilitate offsetting the strip by 10, 20, or 30 centimeters for larger fish.

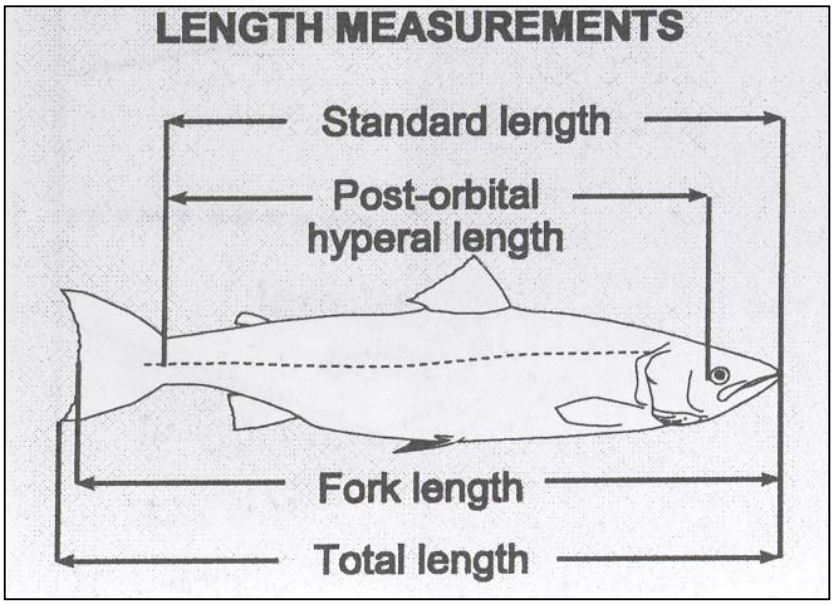


Figure 6- 2: Length Measurements

Measure fish using the following procedure:

1. Lay the fish flat on the plastic measuring strip parallel to the center-line.

2. Close the jaws.

3. Nudge the fish snout against the end of the aluminum board.

4. Stretch out the tail to find the middle rays.

5. Make a mark on the plastic measuring strip in the space where the fork length falls (above the center line for males and below the center line for females). If the fork length falls on a printed line on the strip, try re-measuring the fish first, then if the length still falls directly on the line, use the lower centimeter measurement.

6. When collecting only sex/length data transfer the number of pencil marks (frequency) made at each centimeter measurement (size group) from the plastic length strip to the Length Frequency Form.

7. When collecting individual weight information or taking scales, otoliths, snouts, or viabilities in addition to sex/length information be sure to keep all data from each individual fish together and record it on the Biospecimen Form.

8. Clean the length strip with scouring powder to remove the marks and ready it for the next haul's lengths. Do not scrub too hard because the centimeter lines will be scoured off.

Figure 6- 3: Sexing Fish

Sexing Fish

Data Collection Guidelines

1. Collect sexes from tagged fish.
2. Collect sexes when otoliths are taken.
3. Collect sexes from salmon when scales or snouts are taken.
4. Collect sexes when taking lengths from dead high priority rockfish.

DO NOT sex fish in the following situations:

1. When the fish are being discarded alive. This is common in the Live Fish and Dory Fleet fisheries.
2. When the fish is a hardy species that is likely to survive being discarded. Lingcod, sablefish and Pacific halibut are considered to be hardy species and should not be sexed unless they are dead and tagged.
3. When the fish is tagged but the vessel is retaining the fish and sexing it would damage the product (some vessel may still allow you to sex it, but usually not).

Preparing to Sex Fish

Roundfish, sablefish, rockfish, flatfish and salmon are all sexed slightly differently due to variations in anatomy (See Figures 6-3 and 6-4). Attention should be paid to the cut necessary to locate the gonads, the location of the gonads within the body cavity and the physical description of the gonads.

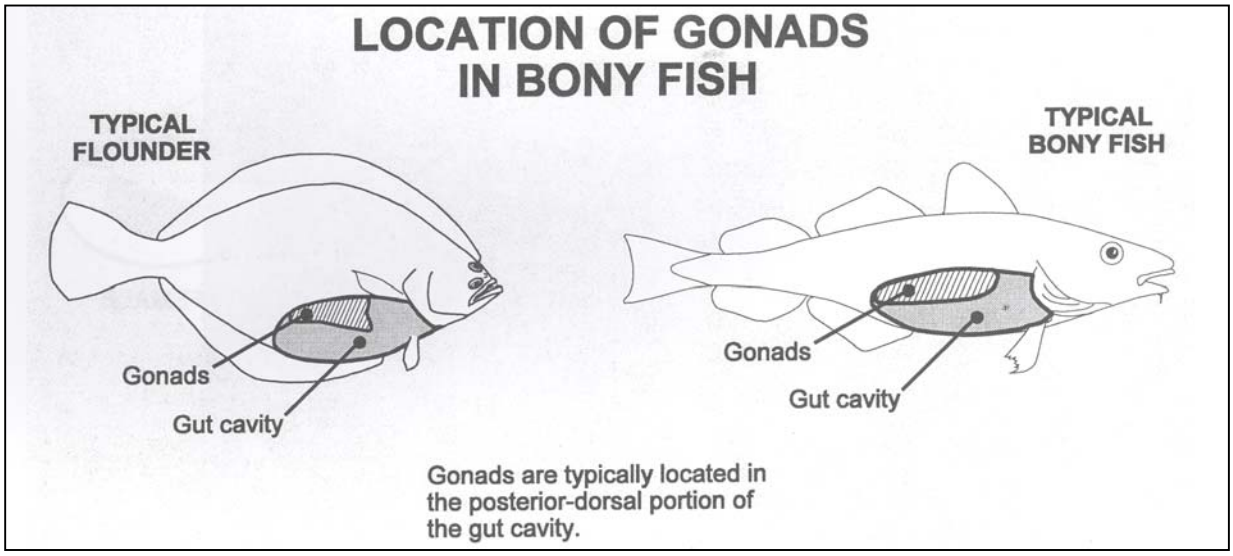


Figure 6- 4: Location of Gonads

Sexing Roundfish

Roundfish gonads are in the visceral cavity, ahead of the anus (See Figure 6-5). Insert a knife or scalpel blade in or near the anus and cut forward toward the head. There are only two organs attached directly to the anus, the intestine and the gonads. Carefully move the other organs aside to get a clear view of the tubes attached to the anus, then pull on the tubes to discern which is the intestine (coiled and ending at the stomach) and which is the gonad (ending in paired structures near the backbone).

The ovaries are paired sacs that are typically pink or orange (or clear when immature). When the ovaries are mature, you should be able to see eggs inside (the sacs will look granular). Pacific cod ovaries often have a black covering on each sac.

The testes of Gadids (cod family) look very different from ovaries. When mature, the testes are convoluted, opaque and smooth in texture. In a mature male, the testes are best described as "greasy-looking, white, twisted Ramen

noodles." Immature testes will be pink or cream colored, have a ruffled look to the edges of the tubes, and be located near the backbone. Often, the paired gonads are fused together and look like a single structure.

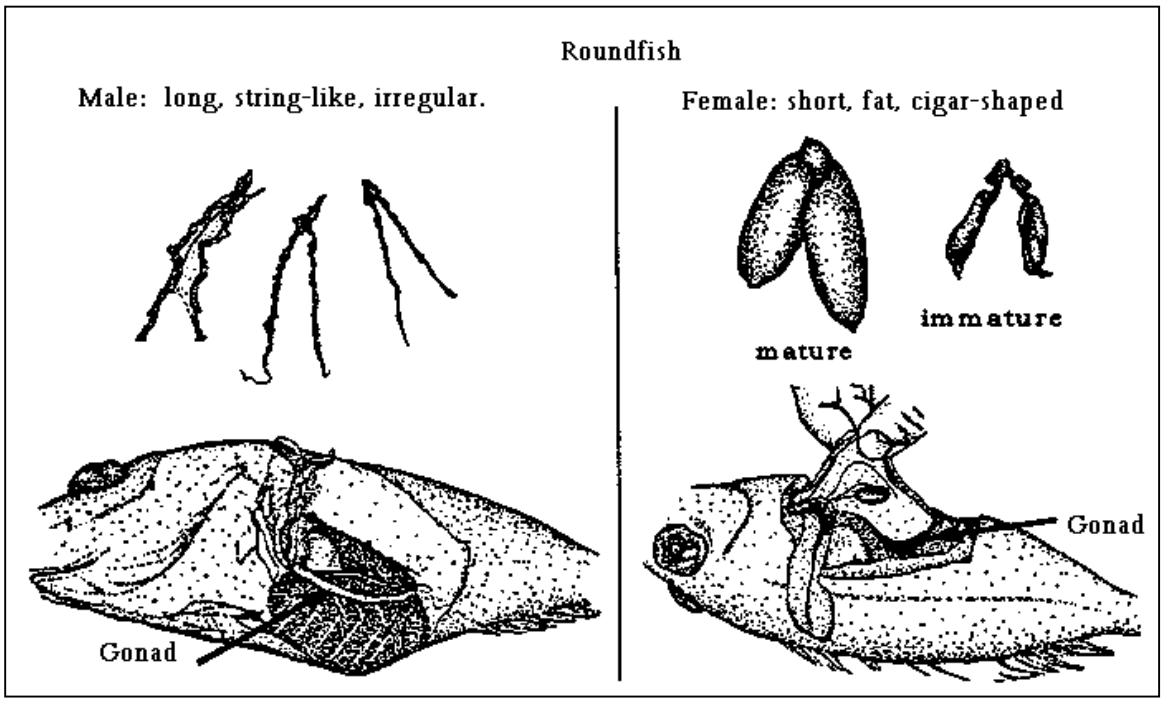


Figure 6- 5: Sexing Roundfish

Sexing Sablefish

The gonads of sablefish are very different from all other roundfish. They are located directly on the backbone, forward toward the head of the fish. Cut up from the anus to the collar to get a clear view. Alternatively, make a cut down from the lateral line to the belly, just behind the operculum, and then another insertion along the belly to the mid-point. Remove all the other organs from the visceral cavity and peer at the backbone area near the posterior of the cavity to look for the gonad tubes. Both females and males have fleshy smooth tubes which are cream or pink in color. Mature fish have liver colored gonad tubes while immature fish will have nearly see-through ribbons. There are no reliable differences in color or texture to differentiate between non-ripe males and females.

To differentiate between the sexes, probe the gonads lobes apart and count the lobes. Males will have four lobes and females will have two lobes. Be cautious when checking the number of gonad lobes. When mature, the ovaries may have a partial fold through each of the two lobes, giving a false impression of four lobes. Cut across the gonad strands to distinguish the true number of lobes.

Also be sure to look at the **posterior** part of the gonad. The lobes of males are fused at the anterior point of the gonad. Since the lobes will be fused anteriorly, they will always look like two lobes at this location and can be mistaken for female gonads.

Sexing Rockfish

Rockfish gonads are found near the backbone in the visceral cavity. Cut from the anus up to the collar and pull aside the intestinal organs. Be careful when doing so as the scales on rockfish are large and tend to make cutting difficult. Trace the gonad strings from the anus upwards until the paired organs are visible. There will always be two strings near the anus that have to be traced back before the sacs can be found. Sometimes there is another structure directly at the anus that appears to be a single gonad sac, but do not assess this as the sex organ! Always follow the string-like tubes up to the paired gonads.

The ovaries will be elongate ovals with granular insides. They will be pink, orange, yellow, or white. The two sacs will have smoothly rounded sides, as opposed to the male testes that have a three-sided, triangular shape in cross-section. If immature, look closely or cut the gonad open to see the granular insides that identify it as female. Rockfishes are live spawners, therefore, spawning females will have larvae in the cavity.

Rockfish testes are cream colored or pink, elongate (5 times as long as they are wide) and smooth in texture. They have three "edges" to the tubes. Instead of a rounded oval tube, testes look triangular in cross section due to the distinct edges. Testes will look like flat tubes when immature, but when examined closely you will see the sharp edges and the triangular shape.

Though you may notice external structures at the anus that seem sexually dimorphic, never sex rockfish using external characteristics. It is too easy to judge an immature male as a female or a huge female as a male when using external characteristics.

Sexing Flatfish

Flatfish gonads are paired, are located posterior to the visceral cavity and extend just under the flesh on both sides of the fish. If the flatfish has an anal spine, the gonads will begin just behind this spine. On the eyeless side of the fish, cut from the anal spine back toward the tail of the fish.
Lift the skin flap and check for a triangular shaped gonad.

Female flatfishes have elongate triangular ovaries that extend from behind the anal spine almost to the tail when mature. When immature, the ovaries are shaped like equilateral triangles with one corner shaped like a smoothly rounded tube extending slightly back toward the tail (the triangle looks like a funnel in shape). The color will be pink (spent, immature) or orange (ready to spawn). Ovaries always have rounded edges on the triangular gonad (See Figure 6-6).

Male flatfishes have a white, equilateral triangle shaped gonads. Unlike the female fish, the male's gonad is not elongated towards the posterior end. Immature males have a small crescent moon shaped, tan colored gonad lying directly at or slightly behind the anal spine. All male flatfishes have sharp edges on the triangular gonad (See Figure 6-6). Lift the gonad with a knife or scalpel and examine the sides of the triangular gonad to distinguish the sharp edges (male) or rounded sides (female). This technique works even on an immature flatfish.

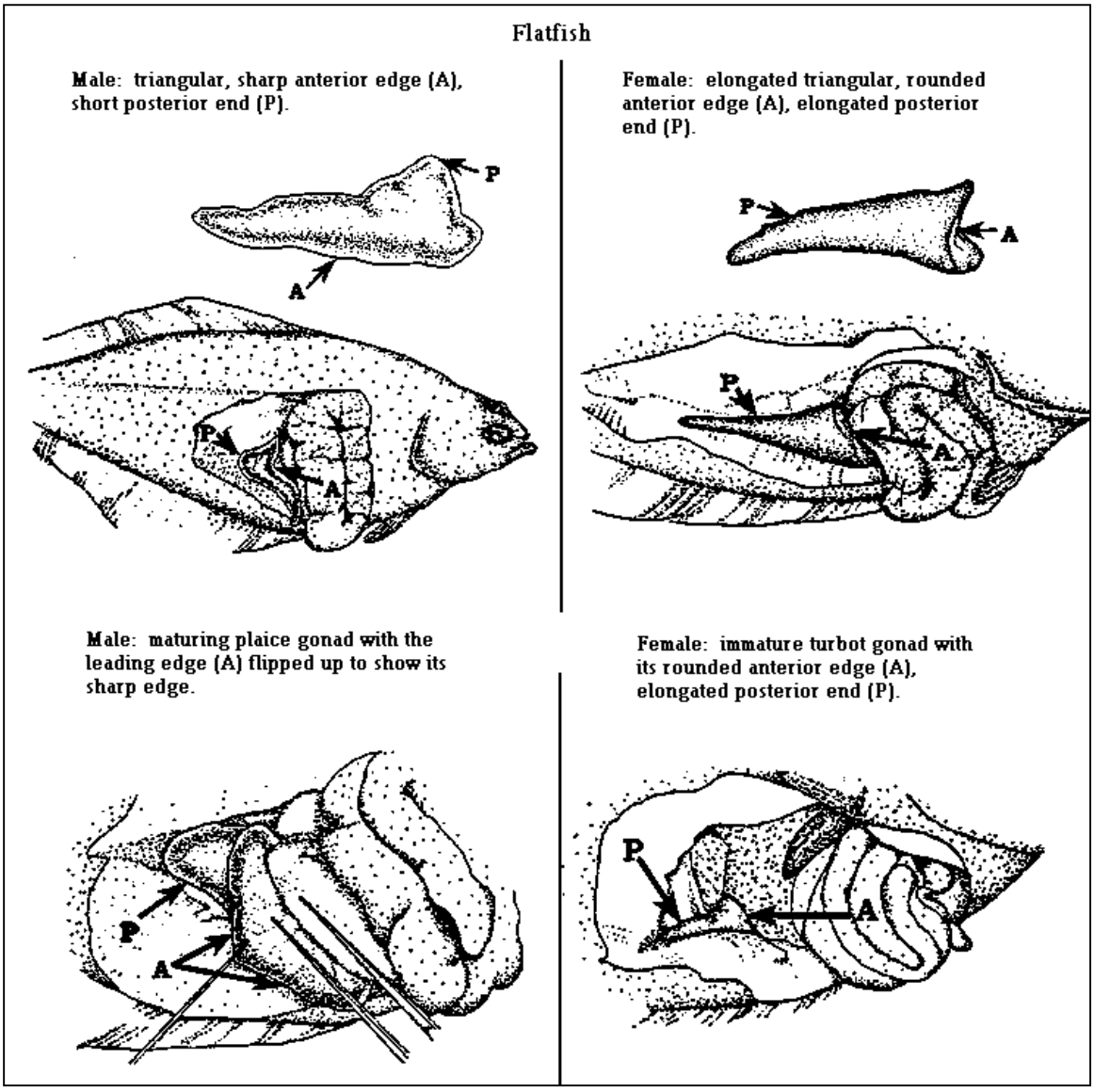


Figure 6- 6: Sexing Flatfish

Sexing Salmon

Salmon gonads are far forward in the body and immediately under the backbone. Cut into the salmon about mid way up from the belly (~1 cm below lateral line) and just behind the pectoral fin. Cut backward and down (about a 60 degree angle) until the top of the peritoneal cavity near the head is revealed. The gonads will be two long tubes lying parallel to the backbone. Females, mature and immature, will have tubes containing granular eggs in sacs that are pink, yellow, or orange. Mature males will have smooth textured tubes of white or cream color. Immature males will have translucent white tubes that appear empty.

Figure 6- 7: Otolith

Otoliths

Data Collection Guidelines

1. Collect otoliths from tagged sablefish.
2. Collect otoliths for high priority rockfish species.
3. Collect additional otoliths at the request of the WCGOP.

Otolith Location

The otoliths are located ventrally to either side of the brain tissue, just above where the pre-operculum is located. The common methods of cutting into a fish's head to remove the pair of otoliths are a vertical cut through the head above the pre-operculum or a horizontal cut through the head just above the eyes. The easiest method to use for most fish is to make a vertical cut down through the top of the head to the otolith pocket. This pocket is located at the two points on either side of the fish's head at which an imaginarily extended lateral line would meet the pre-operacular bone.

Figure 6- 8: Taking Otolith

Species with tiny otoliths are best cut using the horizontal technique. Cutting to the correct point will break open the otolith cavities (one on each side of the brain) exposing the white, calcareous otoliths (See Figures 6-7 and 6-8).

Broken Otoliths

Otoliths are fairly fragile and must be in good condition to be read accurately.

Before collecting otoliths that will be used as part of a scientific collection, collect a variety of fish sizes and practice removing the otoliths. Try a variety of cuts and knife sizes to get comfortable with the angle and amount of pressure required. Field coordinators are available to suggest alternate techniques in cases where otoliths are consistently being broken.

Some otoliths may break or be cut accidentally during at sea collection. If both pieces are present, keep samples with otoliths that have a single break. Discard samples with a shattered otolith or with only one otolith.

Collecting Otoliths in General

Collect otoliths using the following procedure:

1. Firmly grasp the fish by putting thumb and forefinger into the eye sockets or grasp the fish just behind the head, holding it dorsal side up.

2. Position the knife on the top of the head and bear down on the knife with even pressure to cut through the headbone (See Figure 6-9). Pay attention to the amount of pressure being applied. As soon as the cutting gets easier, ease off pressure on the knife to avoid slicing through the otoliths.

3. Break the head open with two hands.

4. Remove the otoliths from the cavity with a pair of forceps.

5. Carefully clean the otoliths by rubbing them between your fingers in water, or on a wet sponge or cloth to remove slime and tissue.

6. Dry the otoliths as much as possible and place the pair of otoliths in a vial (only one pair of otoliths per vial). It is important to get the otoliths clean and as dry as possible before storing them to prevent their rotting.

7. Record the weight, sex, length, and species of the fish on the Biospecimen Form. Also record a Dissection Type of "1" for otoliths and record the bar code number from the otolith vial.

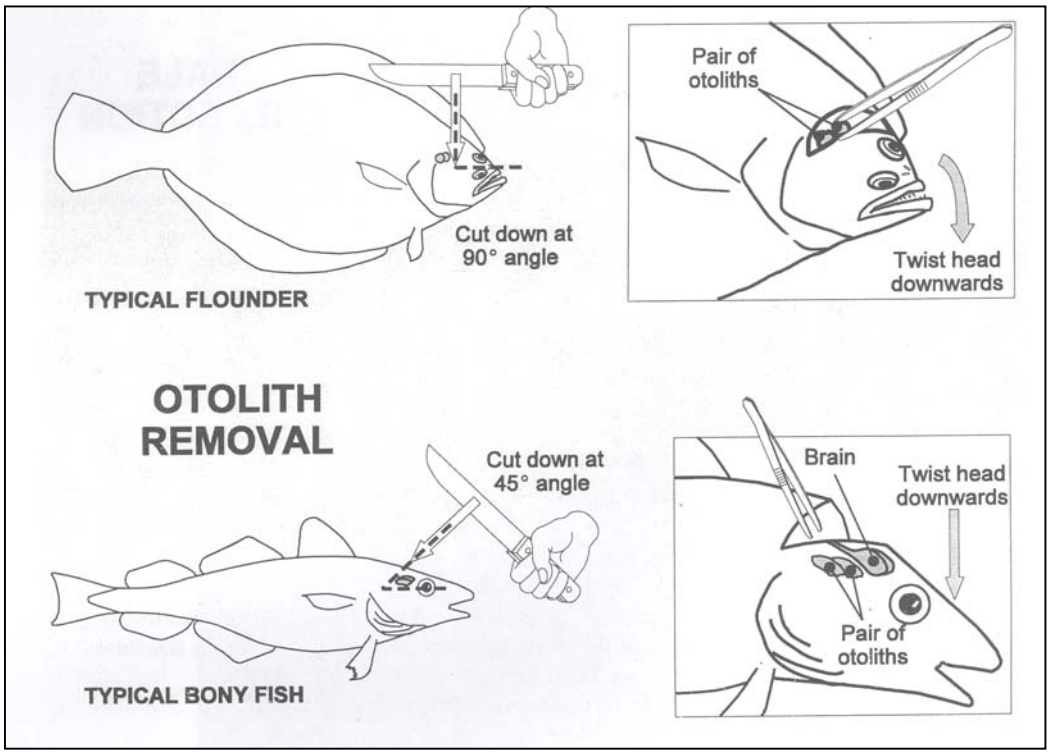


Figure 6- 9: Otolith Removal

Collecting Otoliths from Sablefish

Sablefish have very tiny otoliths. Employ a horizontal cut when working with this species (See Figure 6-10).

Collect sablefish otoliths using the following procedure:

1. Firmly grasp the fish's head.
2. Make a horizontal slice into the head just above the eye. Stop slicing when the knife is just before the preopercle.
3. Make a second vertical cut down into the head until the level of the first cut is reached.
4. Remove the wedge of cut skull. If the cut is correct, no blood should flood the cavity and the brain tissue should be visible.
5. Grasp the brain tissue with forceps and pull it out or peel it back from the cavity.
6. On either side of the brain cavity there is a fluid-filled pocket containing an otolith. Insert forceps into the pockets, to remove the bony structures floating within the fluid.
7. Carefully clean the otoliths by rubbing them between your fingers in water, or on a wet sponge or cloth to remove slime and tissue.
8. Dry the otoliths as much as possible and place the pair of otoliths a vial (only one pair of otoliths per vial). It is important to get the otoliths clean and as dry as possible before storing them to prevent their rotting.

9. Record the weight, sex, length, and species of the fish on the Biospecimen Form. Also record a Dissection Type of "1" for otoliths and record the bar code number from the otolith vial.

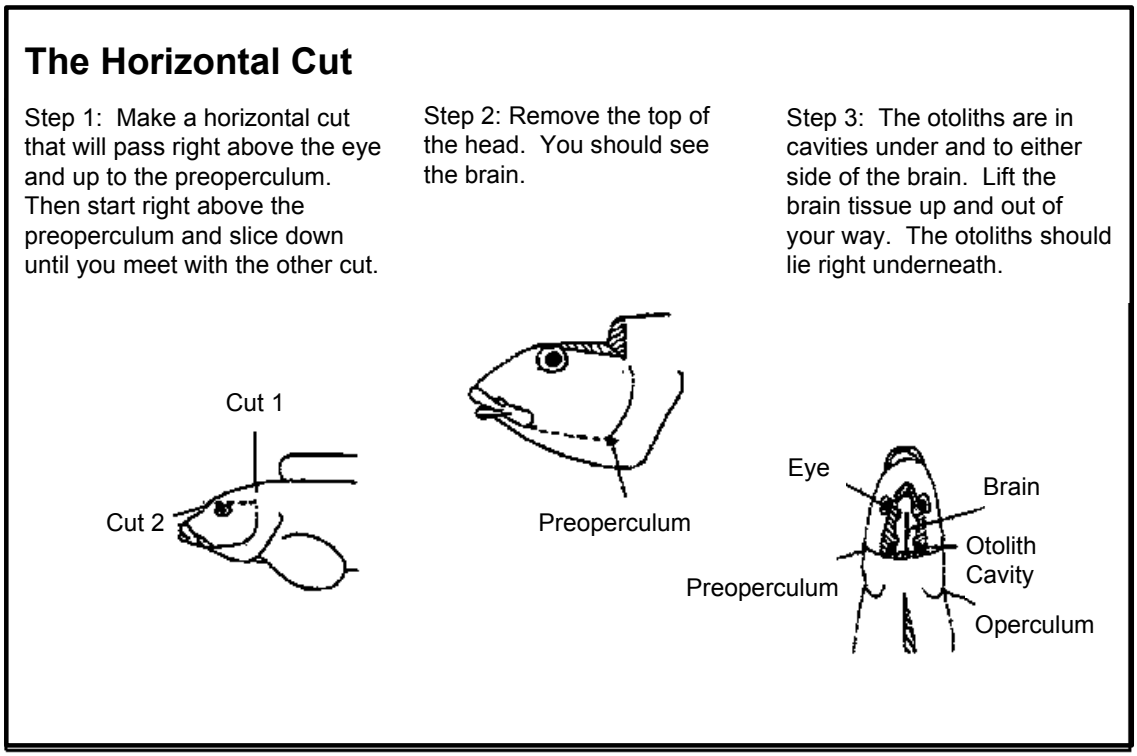


Figure 6- 10: Horizontal Cut Method

Pacific Halibut Viabilities

Data Collection Guidelines

1. Collect viabilities for DISCARDED Pacific halibut that have undergone NORMAL handling by the crew.

2. Always measure the length of Pacific halibut used for viabilities. Do NOT estimate the lengths.

Figure 6-11: Pacific halibut

Preparing to Collect Viabilities and Lengths from Pacific Halibut

In general, take viabilities and lengths for all discarded Pacific halibut in a haul/set. If you are unable to sample all of the Pacific halibut in a haul/set for viabilities and lengths, randomly select the individuals to use. A discussion of random sampling for biospecimens is contained earlier in this chapter.

The injury criteria and viability codes used to assess Pacific halibut viabilities vary by gear type. Make sure to use the correct set of criteria and codes when making injury assessments. A list of injury keys and codes follows:

1. Trawl Gear – "Viability Criteria and Injury Key for Trawl Caught Pacific Halibut" (Appendix K)
   - E – Excellent
   - P – Poor
   - D – Dead

2. Pot Gear - "Viability Criteria and Injury Key for Pot Caught Pacific Halibut" (Appendix L)
   - E – Excellent
   - P – Poor
   - D – Dead

3. Hook and Line Gear -"Viability Criteria and Injury Key for Hook and Line Caught Pacific Halibut" (Appendix M)
    - MI – Minor
    - MO – Moderate
    - S – Severe
    - D - Dead

Pacific halibut are often quite large and will be longer than the 100 cm length strips (See Figure 6-11). Prepare to take viabilities and lengths by offsetting the length strip by 20 or more centimeters. On the length strip, replace the M (male) and F (female) markings with the set of viability codes applicable to the gear type being used. As each Pacific halibut is measured and checked for injuries, a hatch mark will be recorded on the length strip for the appropriate length and viability.

Collecting Viabilities and Lengths from Pacific Halibut

Pacific halibut viabilities should NEVER be guessed. Always have the Pacific halibut in hand when taking viabilities.

In addition, viabilities should reflect the normal handling of Pacific halibut by the crew. If the vessel does not discard fish immediately, do not take the viabilities until the crew is preparing to discard the fish. The purpose of taking viabilities is to ascertain the condition of the fish when it returns to the sea.

Collect Pacific halibut viabilities and lengths using the following procedure:

1. Closely examine the Pacific halibut on both sides for injuries.

2. Use the appropriate Pacific halibut injury key to assign a viability code to the fish. Injury keys are located in the appendices as follows: Trawl (Appendix K), Pot (Appendix L) or Hook and Line (Appendix M).

3. Measure the fork length of the Pacific halibut by laying it directly on the plastic length strip. Never hold the tape measure over the top of the fish and "sight down" or take a curvilinear length as both of these methods introduce inaccuracies.

4. Place a hatch mark on the plastic length strip next to the appropriate length and viability.

5. Record the length and viability on the Biospecimen Form.

Salmon Scales

Data Collection Guidelines

1. Collect scales from the first five individuals of each salmon species encountered during your contract first contract, and the first two individuals encountered during each subsequent contract..

2. Collect scales for any salmon where you are unsure of the species.

3. Collect scales for all salmon where external tags or snouts are collected.

4. Collect additional scales at the request of the WCGOP.

Collecting Salmon Scales

Salmon lose scales easily and lost scales are replaced with regenerated scales. These regenerated scales and lateral line scales are unusable for aging purposes. Always collect at least 5 scales and never collect scales from the lateral line to be sure the scales are useable.

Collect salmon scales using the following procedure:

There are 8 species of salmonids encountered in the Eastern Pacific:
- King (Chinook)
- Silver (Coho)
- Sockeye (Red)
- Chum (Dog)
- Pink (Humpback)
- Atlantic salmon
- Steelhead (Sea-run Rainbows)
- Cutthroat trout

1. Wipe the area on the fish where you plan to collect scales. This ensures no other fish scales will be mixed in with the individual's scales. It also removes slime, which causes scales to decompose in the scale envelopes.

TIP* Remember, salmon rub against many other fish, even other salmon of different ages and species. To insure accurate data, make sure scales are clean.

2. Collect scales midbody from the area just above or below the lateral line. See Figure 6-12 for preferred scale collection zones. Never collect scales that lie directly on the lateral line.

3. Pluck salmon scales out of the flesh using forceps or a knife. Try to minimize mucus on the scales by plucking rather than scraping. If taking scales from multiple fish, be sure to clean the forceps between fish.

4. Open a paper salmon scale envelope and wipe the scales inside. Make sure you collect at least five scales. Seal the envelope.

5. Check for clipped adipose fin. If the adipose fin is clipped, the salmon is likely a tagged fish. Collect the snout of the salmon following the instructions in the Tagged Fish section of this chapter.

6. Weigh the salmon.

7. Determine the sex of the salmon.

8. Measure the length of the salmon.

9. Record the weight, sex , length , species, trip number and haul number on the scale envelope.

10. Record the weight, sex, length, and species of the fish on the Biospecimen Form. Also record a Dissection Type of "2" for scales and the bar code number from the scale envelope.

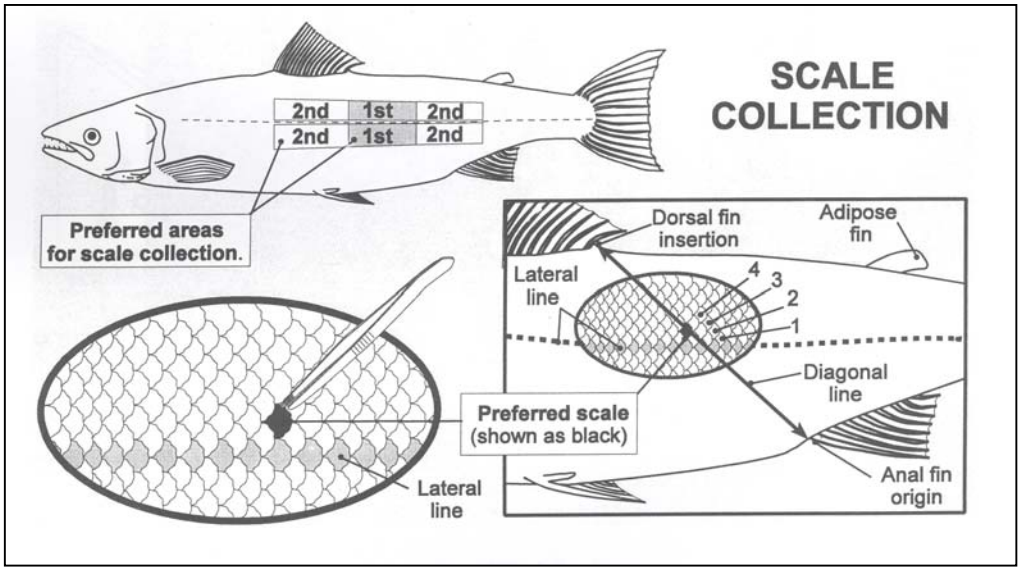


Figure 6- 12: Salmon Scale Collection

Tagged Fish

Data Collection Guidelines

1. Collect weight, length, sex, tag and tag data from all externally tagged fish.

2. Collect salmon weight, length, sex, scales, and snout from all salmon missing an adipose fin.

Preparing to Collect Tags

Inform the vessel crew that all tagged fish should be saved (See Figure 6-13). Species that have been tagged include Pacific cod, Pacific halibut, California halibut, pollock, sablefish, salmon, some rockfish species and shortspine thornyhead.

If vessel personnel provide an external tag or an externally tagged animal, write down the person's name and address to enable them to receive a reward for returning the tag. Observers cannot collect rewards for tags they submit. Observers who find tagged fish or crab should list the captain as the person who found the tagged animal.

Figure 6- 13: Tagged Sablefish

Collecting Tags

Tags for fish other than salmon are usually externally located on the dorsal surface or on the gill cover. Spaghetti tags are the most common type of external tag but some fish may have disc-shaped tags. If a tag is provided without the actual fish, collect as much information as possible from the crew member who gave you the tag including the tag collection date and location.

Tagged salmon usually have internal coded wire tags or PIT tags inserted into their snouts but some may have external disc shaped tags on their dorsal fins. Coded wire tags are about 1 mm in length and have a distinct code, usually a series of slashes at different intervals engraved on them. PIT tags are electronically coded tags that require a reader to decipher. Salmon tagged with coded-wire or PIT tags are identified by a missing adipose fin. Neither type of snout tag can be removed in the field, therefore, the entire snout must be collected and returned.

Collect biological information from tagged fish using the following procedure:

1. Remove the external tag or salmon snout. The collection procedure for salmon snouts follows this section.

2. Weigh the fish if possible.

3. Determine the sex of the fish.

    - In the case of LIVE Pacific halibut, do NOT attempt to sex the fish or remove the tag. Just record the tag number and other pertinent data.

4. Measure the length of the fish.

5. Collect otoliths from the fish.

   - In the case of LIVE Pacific halibut, do NOT attempt to collect otoliths.

   - In the case of sablefish with a blue spaghetti tag, collect the entire head and FREEZE it. The otoliths have been treated with a light sensitive chemical.

6. Collect scales if the fish is a salmon. The collection procedure for salmon scales is located earlier in the chapter.

7. Complete a Tagged Fish Form.

8. Record the weight, sex, length, and species of the fish on the Biospecimen Form. Also record a Dissection Type of "1" if otoliths have been taken, a "2" if salmon scales have been taken or a "3" if a snout has been collected. Record the bar code number from the otolith vial or scale envelope. Record external tag numbers in the Tag # column.

Collecting Salmon Snouts

Collect Salmon Snouts using the following procedure:

Figure 6- 14: Removed Salmon Snout

1. Make a cut one centimeter behind the eye, down through the head to the base of the upper jaw. The lower jaw does not need to be included since tags are placed in the upper snout. (See Figures 6-14 and 6-15)

2. Place the snout in one of the issued plastic bags and put several handfuls of table or rock salt in the bag. If no salt can be found, freeze the snout or place it in the hold with the retained fish.

3. Complete a Specimen Collection Label and include the set/retrieval location on the back of the label. Place the label inside the bag with the snout.

4. Periodically, drain off any liquid that accumulates in the bag and change the salt.

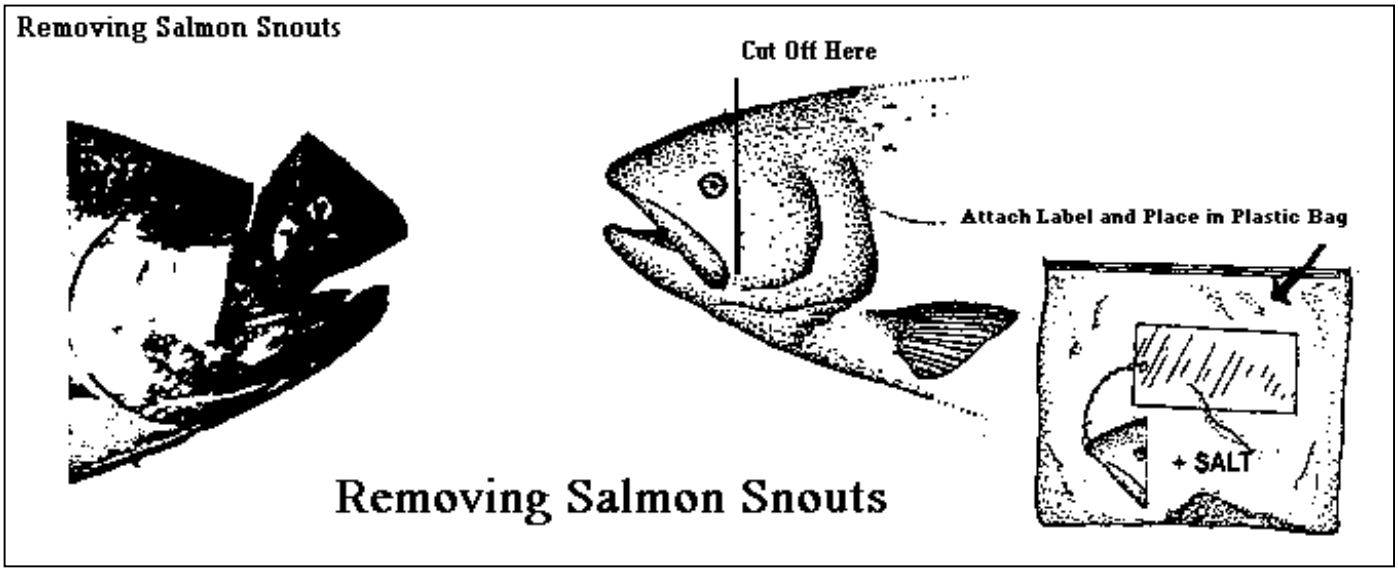


Figure 6- 15: Removing Salmon Snouts

Collecting Fish Specimens

Periodically observers will be asked to collect fish for training and other purposes. Observers are also required to bring in any fish that they are unable to identify at sea. When collecting fish adhere to the following procedures:

1. Place fish in a zip-lock bag. Do not include more than three fish per bag, and then only include fish of the same species.

2. Complete a Specimen Collection Label and place the label inside the zip-lock bag with the fish. If it is a specimen where the identification is uncertain, be sure to include the name used to enter the fish in the database.

3. Freeze the specimen as soon as possible. If the specimen cannot be frozen at sea, keep it on ice.

4. After returning to port, make arrangements to send the specimen to your coordinator, debriefer or to the Newport office. Always call ahead of time to insure that the specimens do not arrive when there is nobody present to receive them.

V. Data Collection Forms

There are four data collection forms to use when collecting biospecimen information.

1. Length Frequency Form
   - Use this form to record species, sex, and length data when only this information is being collected. Data can be recorded for individual fish or for groups of fish with identical species, sex and length values.

2. Biospecimen Form
   - Use this form to record data for individual fish when any information beyond species, sex, and length has been collected.
   - Use this form to record Pacific halibut viabilities.
   - Use this form to record data when otoliths, scales, snouts or tags have been collected.

3. Tagged Fish Form
   - Use this form to record data for tagged fish.

4. Specimen Collection Label
   - Use this form to record data when salmon or sablefish snouts have been collected.
   - Use this form to record data when whole fish/inverts have been collected.

Record data on either the Length Frequency Form or the Biospecimen Form. **NEVER** record data on both forms or the fish will be counted twice.

Length Frequency Form Instructions

Complete the Length Frequency Form for fish when only length and/or sex information is taken and no tags or dissections are collected. Fish should be grouped together whenever the species, length and sex for all the fish in the group are the same. An example of the form is included as Figure 6-16.

- **Haul Number –** Record the number of the haul that the sample came from.
- **Date –** Record the date as MM/DD/YY.
- **Trip Number –** Record the trip number generated by the database system.
- **Coast Guard Number –** Record the USCG vessel number on limited entry trawlers and fixed gear vessels (if they have one). Do not record anything in this field if you are on an open access vessel or a limited entry fixed gear vessel that does not have a USCG number.
- **Catch # -** Record the number that corresponds to the catch category on the Catch Form.
- **Catch Category –** Record in capital letters the catch category the species is in as recorded on the Catch Form.
- **R or D –** Record whether the sample came from an **R** – Retained or **D** – Discarded catch category.
- **Species Name -** Record the **common name** of the species the length frequencies were taken from. This column must be filled in with the species name. Do not only enter the species code! The common name listed on the paperwork must match the common name used in the database.

- **Species Code** - Record the species code of the corresponding species. See Appendices A and B for lists of species and species codes.

- **Method –** Record the Biological Sampling Method used to obtain fish for length frequencies.

  6 - Outside and Nonrandom
  7 - Outside and Random
  8 - Inside and Nonrandom
  9 - Inside and Random

- **Sex –** Record **M** – Male, **F** – Female, or **U** – Unknown (individuals where the sex cannot be determined). If you did not attempt to sex the individual, LEAVE THE COLUMN BLANK!

- **KP Length –** Sum up all of the length **by species** and note total of all lengths in the KP Length (keypunch length) column.

- **KP Frequency -** Sum up all of the frequencies **by species** and note total of all frequencies in KP Freq (keypunch frequency) column.

- **Length –** Record the length of the group of fish, in centimeters.

- **Freq –** Record the number of individual fish in each length group.

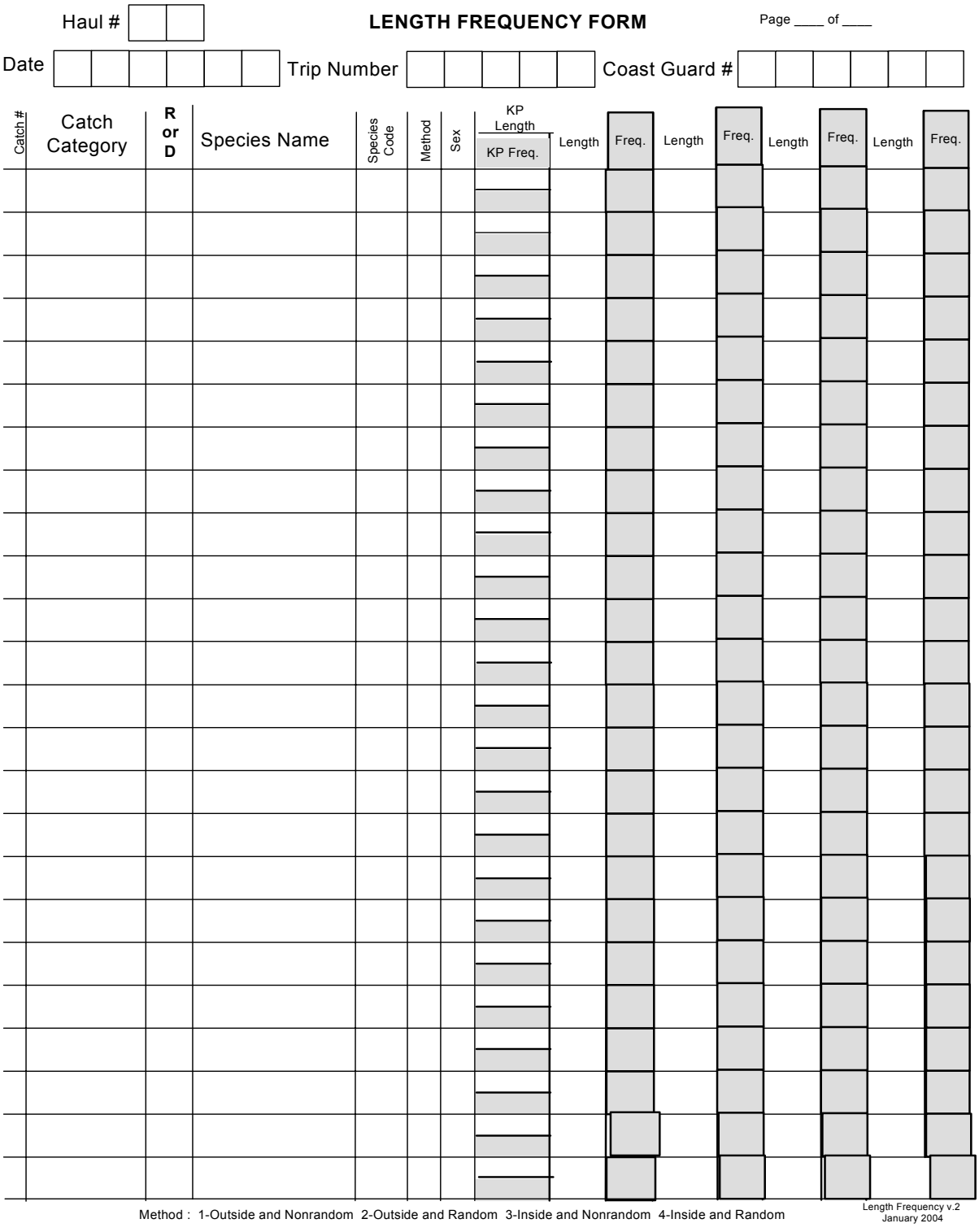


Figure 6-16: Length Frequency Form

Biospecimen Form Instructions

Complete the Biospecimen Form any time data beyond species, sex, and length are being collected on an individual fish. Complete this form when collecting Pacific halibut viabilities, otoliths, scales, snouts or tags. This form is also often used to record individual weights and lengths of fish caught in the Live Fish fishery. An example of the form is included as Figure 6-17.

- **Haul Number –** Record the number of the haul that the sample came from.
- **Date –** Record the date as MM/DD/YY.
- **Trip Number –** Record the trip number generated by the database system.
- **Coast Guard Number –** Record the USCG vessel number on limited entry trawlers and fixed gear vessels (if they have one). Do not record anything in this field if you are on an open access vessel or a limited entry fixed gear vessel that does not have a USCG number.
- **Catch # -** Record the number that corresponds to the catch category on the Catch Form.
- **Catch Category –** Record in capital letters the catch category the species is in as recorded on the Catch Form.
- **R or D –** Record whether the sample came from an **R** – Retained or **D** – Discarded catch category.
- **Species Name -** Record the **common name** of the species. This column must be filled in with the species name. Do not only enter the species code! The common name listed on the paperwork must match the common name used in the database.

- **Species Code** - Record the species code of the corresponding species. See Appendices A and B for lists of species and species codes.

- **Method –** Record the Biospecimen Sampling Method used to obtain fish for biospecimens.

  6 - Outside and Nonrandom
  7 - Outside and Random
  8 - Inside and Nonrandom
  9 - Inside and Random

- **Sex –** Record **M** – Male, **F** – Female, or **U** – Unknown (individuals where the sex cannot be determined). If you did not attempt to sex the individual, LEAVE COLUMN BLANK.

- **Viabilities –** Record the viability for **Pacific halibut ONLY**. Refer to Appendices K, L and M for viability criteria.

  Trawl and Pot
  D = Dead
  P = Poor
  E = Excellent

  Hook and Line Gear
  D = Dead
  S = Severe
  MO = Moderate
  MI = Minor

- **Length –** Record the length of the individual fish in centimeters.

- **Weight –** Record the weight of the individual fish. Do not use extrapolated or halibut conversion weights.

- **Maturity Stage** – Record the maturity stage of the individual fish. This field should only be completed if special instructions from a coordinator are given.

- **Dissection Type –** Record the type of dissection that was taken. (Multiple dissection types can be recorded for an individual fish. Do NOT record all information for the fish multiple times – leave all fields except dissection type blank when recording extra dissections or it will appear that the dissections came from two different fish.)

  1 – Otoliths
  2 – Scales
  3 – Snout
  4 – Tissue

- **Barcode Number –** Record the barcode number of the vial, envelope, or other container that the dissected part was placed in.

- **Tag Number –** Record the tag number if the individual was tagged.

- **Comments –** Document any important information regarding the individual fish.

- **KP Length –** Sum up all of the lengths **by species** and note total of all lengths in the KP Length (keypunch length) column.

- **KP Frequency -** Sum up all of the frequencies **by species** and note total of all frequencies in KP Freq (keypunch frequency) column.

.

Haul # ☐☐ **BIOSPECIMEN FORM** Page ____ of ____

Date ☐☐☐☐☐☐ Trip Number ☐☐☐☐☐ USCG # ☐☐☐☐☐☐☐

Catch Category	D/R	Species Name	Species Code	KP Length / KP Freq.	Weight	Length	Barcode #	Tag #	Comments

Method : 1-Outside and Nonrandom 2-Outside and Random 3-Inside and Nonrandom 4-Inside and random

Dissection Type: 1 - Otoliths 2 - Scales 3 - Snouts 4 - Tissue

Biological Sampling Form v.3
January 2004

Figure 6-17: Biospecimen Form

Tagged Fish Form Instructions

Only complete the Tagged Fish Form for tagged fish. Attach the tag and otoliths directly to the form. An example of the form is included as Figure 6-18.

- **Trip No.** – Record the trip number generated by the database system.
- **Vessel ID No. –** Record the USCG number or state registration number (begins with CF, OR or WN) of the vessel.
- **Base Permit No.** – Record the Groundfish Permit number.
- **Observer Name** – Record your first and last name.
- **Vessel Name** – Record the name of the vessel on which the tag was collected.
- **Captain (or reward recipient's) Name** – Record the name of the person who found the tag or to whom any reward will be given. If the observer finds the tag, record the name of the vessel skipper or as otherwise instructed by the skipper.
- **Address** – Record the address of the reward recipient.
- **Species** – Record the common name of the species from which the tag was collected.
- **Tag Prefix and Serial No**. – Record this data if discernible from the tag.
- **Tagging Agency** – Circle which agency/lab tagged the specimen as recorded on the tag (if discernible).

- **Time and Date of Capture** – Record the retrieval time of the haul/set as MM/DD/YY.

- **Capture Location** – Record the retrieval position (latitude and longitude) of the haul/set.

- **Sex and Maturity of Gonads** – Record the sex of the fish. Do not record maturity stage.

- **Length** – Record the fork length of the fish in centimeters.

- **Weight** – Record the weight of the fish in pounds.

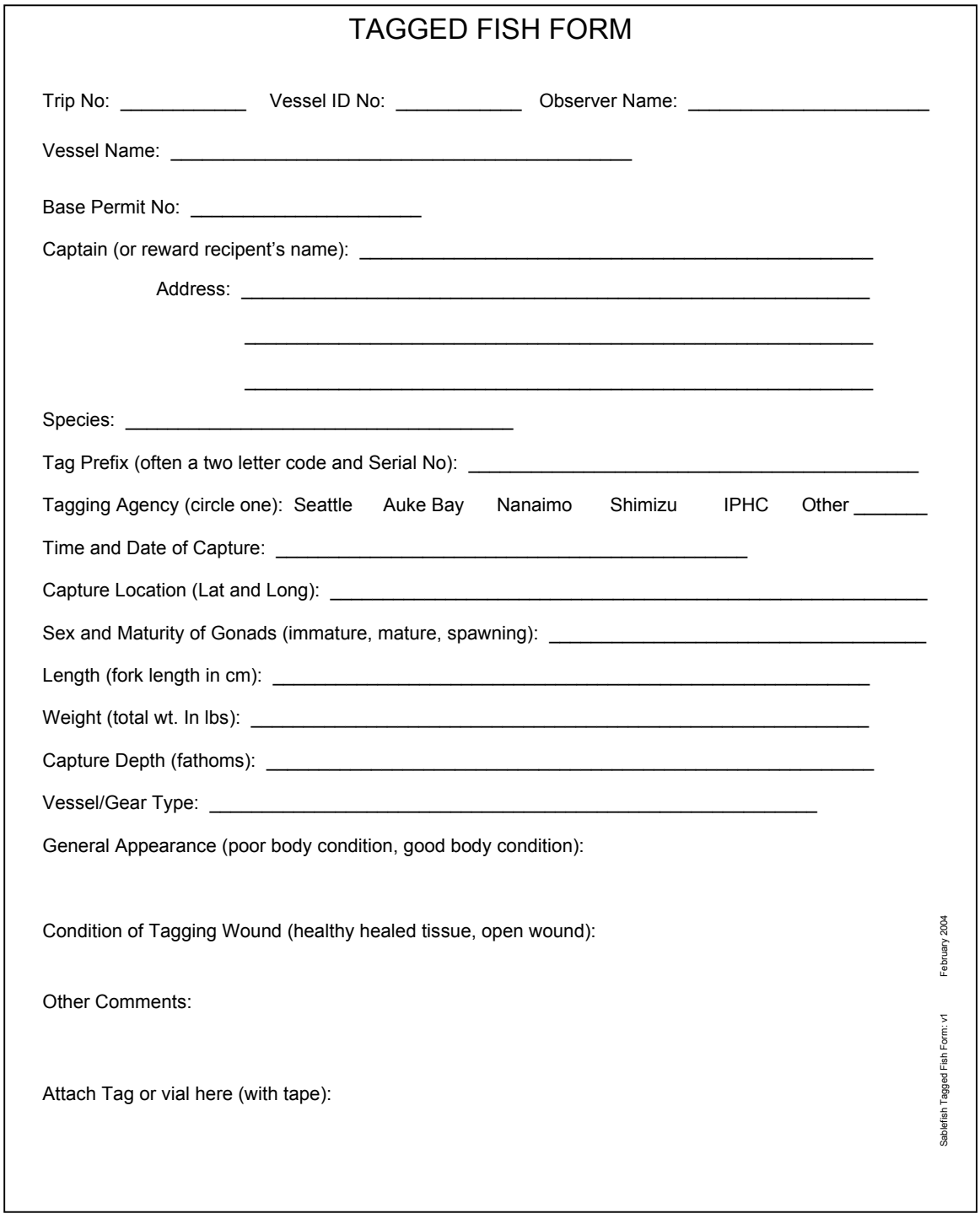
- **Capture Depth** – Record the retrieval depth of the haul/set in fathoms.

- **Vessel/Gear Type** – Record what gear type was utilized when the fish was captured (bottom trawl, midwater trawl, pot, longline, etc.)

- **General Appearance** – Note condition of the body including any wounds, scars or abnormalities.

- **Condition of Tagging Wound** – Note condition of the area around tag (open wound, scarred over, etc).

- **Other Comments** – Note anything else unusual or pertinent to the tagged fish.



TAGGED FISH FORM

Trip No: _____ Vessel ID No: _____ Observer Name: _____

Vessel Name: _____

Base Permit No: _____

Captain (or reward recipent's name): _____

Address: _____

_____

_____

Species: _____

Tag Prefix (often a two letter code and Serial No): _____

Tagging Agency (circle one): Seattle Auke Bay Nanaimo Shimizu IPHC Other _____

Time and Date of Capture: _____

Capture Location (Lat and Long): _____

Sex and Maturity of Gonads (immature, mature, spawning): _____

Length (fork length in cm): _____

Weight (total wt. In lbs): _____

Capture Depth (fathoms): _____

Vessel/Gear Type: _____

General Appearance (poor body condition, good body condition):

Condition of Tagging Wound (healthy healed tissue, open wound):

Other Comments:

Attach Tag or vial here (with tape):

Sablefish Tagged Fish Form: v1 February 2004

Figure 6-18: Tagged Fish Form

Specimen Collection Label Instructions

Complete the Specimen Collection Label when salmon or sablefish snouts have been collected or when a whole fish or invert has been collected. An example of the form is included as Figure 6-19.

Tip* - Before going to sea, take 10 – 20 specimen collection labels and place a WCGOP bar code sticker on the back of the each label while the labels are clean and dry.

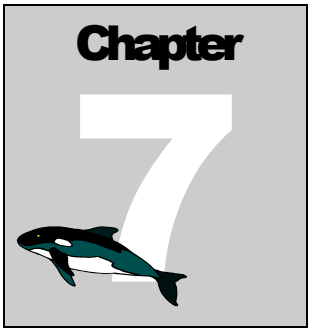
- **Vessel Name** – Record the name of the vessel on which the specimen was collected.
- **Haul Number** – Record the haul number from which the specimen was collected.
- **Trip Number** – Record the trip number generated by the database system.
- **Date** – Enter the date that the haul/set was retrieved as MM/DD/YY.
- **Species Identification** – Record the common name of the species.
- **Entered As** – Record the species name entered into the database, if this differs from the above (e.g. you entered it as rockfish, unidentified but believe it was a canary rockfish).
- **Depth (FM)** – Record the retrieval depth of the haul/set in fathoms.
- **Length (cm)** – Record the length of the fish, in centimeters.

- **Weight (LB)** – Record the weight of the fish, in pounds.
- **Sex** – Record the sex of the fish (if applicable).
- **Observer Name** – Record your first and last name.
- **B**ar **Code Sticker** – When collecting snouts, be sure to affix a WCGOP bar code sticker to the back of the specimen label in order to uniquely identify the specimen.

SPECIMEN COLLECTION LABEL
West Coast Groundfish Observer Program
DOC/NOAA/NMFS/NWFSC/FRAMD
2725 Montlake Blvd. Seattle, WA 98112
(use pencil ONLY!)

VESSEL NAME_____ HAUL NUMBER_____
TRIP NUMBER_____ DATE_____
SPECIES IDENTIFICATION_____
ENTERED AS_____
DEPTH(FM)_____ LENGTH(CM)_____
WEIGHT(LB)_____ SEX (if applicable)_____
OBSERVER NAME_____

Figure 6-19: Specimen Collection Label



Marine Mammals, Seabirds and Sea Turtles

Focus Questions:

- What physical specimens may be collected from marine mammals?
- What seabird species are endangered or threatened?
- What physical measurements should be taken for a sea turtle?

Chapter Outline:

I. Marine Mammals

II. Seabirds

III. Sea Turtles

I. Marine Mammals

Introduction

The Pacific Ocean is home to a vast number of marine mammals. Interactions between fishing operations and marine mammals are unavoidable. Observers provide reliable estimates of marine mammal mortality and other interactions due to fishing operations.

For marine mammals encountered in a haul or set, WCGOP Observers collect length, sex and weight data for individuals. In the case of sea lions and Northern fur seals, Observers are asked to collect canine teeth which are used by the National Marine Mammal Laboratory (NMML) for species identification and aging purposes. Tissue samples from cetaceans are also collected for use by NMML for genetic analysis.

Marine mammal sighting data contributed to the NMML by Observers provide important information on the distribution and behavior of marine mammals. There are several species in the Pacific Ocean that are threatened or endangered, and information on these animals is of great interest.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (MMPA) was most recently reauthorized in 1994. In passing the MMPA, Congress found that certain species and populations of marine mammals are, or may be, in danger of extinction or depletion as a result of human activities. The Act states:

- Such species and population stocks should not be permitted to diminish beyond the point at which they cease to be a significant functioning element in the ecosystem of which they are a part, and, consistent with this major objective,

they should not be permitted to diminish below their optimum sustainable population level.

- Measures should be taken immediately to replenish any species or population stock, which has diminished below its optimum sustainable level.

- There is inadequate knowledge of the ecology and population dynamics of such marine mammals and of the factors, which bear upon their ability to reproduce themselves successfully.

- Marine mammals have proven themselves to be resources of great international significance, aesthetic and recreational as well as economic.

The MMPA established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters, by U.S. citizens on the high seas, and on the importation of marine mammals and marine mammal products into the United States. As a NMFS approved Observer you are authorized, under provision 50 CFR 229.7 of the Federal Code of Regulations, to take and possess marine mammal specimens. The only specimens you should ever have in your possession are pinniped snouts and cetacean tissues. **Do not collect bones, skulls, or any other parts as specimens**, they are not needed and will be discarded. Walrus and sea otters are under the jurisdiction of the U. S. Fish and Wildlife Service and you are not allowed to possess any specimen material from them. Possession of any part of a walrus or sea otter is a federal offense.

Under the Marine Mammal Protection act it is also illegal to intentionally feed any marine mammal in the wild. Intentional feeding is considered a form of harassment. Fully document any intentional feeding of marine mammals in your logbook. Include the name(s) of the person(people) involved in the

incident, a description of the marine mammal, and a summary of where and how the violation occurred.

Marine Mammal Data Collection Priorities

The role of Observers under the MMPA is to conduct statistically reliable monitoring of fishing operations and to record information on all interactions between fishing operations and marine mammals. Always whole haul sample for marine mammals caught by a vessel's fishing gear.

Marine mammal data collection in order of priority:

1. Collect length, sex, and weight (if possible) information from any dead marine mammal brought on board a fishing vessel.

2. Collect canine teeth (snouts) from any dead sea lion or Northern fur seal brought on board a fishing vessel.

3. Collect tissue from any dead cetacean brought on board a fishing vessel.

4. Collect interaction and sighting information on marine mammals that interact directly with the fishing vessel and/or the vessel's fishing gear.

5. Collect sighting information on marine mammals that are visible from the vessel while at sea.

Marine Mammal Data Collection Procedures

Data collection from marine mammals falls into two categories, the collection of biological specimen information and the collection of interaction and sighting information. Biological specimen information is collected from dead marine mammals brought on board fishing vessels and includes the length, sex and weight of the animal. Collection of specimen data may also include taking a physical sample such as a snout or tissue sample.

Interaction and sighting information is collected from live marine mammals that come in contact with the fishing vessel or that can be seen from the fishing vessel while at sea. Interaction and sighting information includes a physical description of the marine mammal(s), behavioral information and data about the physical environment (sea state, visibility, etc.).

When collecting biological specimen or interaction and sighting information from marine mammals, follow the data collection procedures explained below.

Lengthing Marine Mammals

All dead marine mammals captured during fishing operations must be measured. Before touching a marine mammal, remember that there are many diseases that are transferable from marine mammals to humans. Always wear gloves when handling a marine mammal.

There are two acceptable methods for measuring marine mammals, standard lengths and curvilinear lengths. Taking a standard length is the preferred method for measuring a marine mammal. The standard length of a marine mammal is the distance in a straight line from the tip of the snout or rostrum to the tip of the tail notch (See Figure 7-1, measurement #1). A curvilinear length, on the other hand, is the shortest surface distance from the tip of the snout or rostrum to the tip of the tail notch along the back, belly, or

side (See Figure 7-1, measurement #2). This method is used if rigor has set in or the animal is too large or deteriorated to maneuver.

Collect marine mammal lengths using the following procedure:

1. Put on a pair of rubber deck gloves to prevent the transfer of disease.

2. Lay the marine mammal on its back with its head and vertebral column in a straight line as best possible.

3. Take the standard length by measuring the straight line distance from the tip of the snout or rostrum to the tip of the tail notch on an animal that is belly up (preferred method).

   OR

   Take the curvilinear length by measuring the shortest surface distance from the tip of the snout or rostrum to the tip of the tail notch along the back, belly, or side.

4. Record the length, sex, weight (if possible) and species on the Biospecimen Form.

5. Record interaction and sighting information on the Marine Mammal Sighting Form.

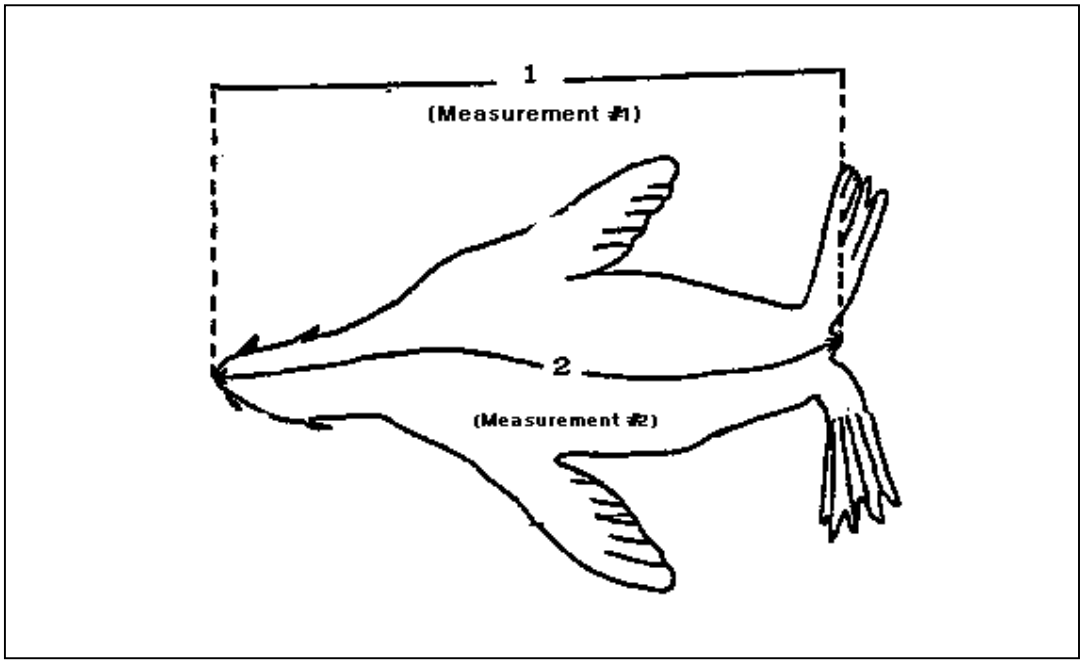


Figure 7-1: Pinniped Measurements (NPGOP)

Sexing Marine Mammals

Sexing of marine mammals is not difficult. See the diagrams in Figure 7-2 to view the morphological differences between male and female cetaceans and pinnipeds.

In Cetaceans, the distance between the anus and the genitals is greater in males. Otherwise the sexes appear similar because both sexes have external teats, and females have an enlarged clitoris.

Determine and record marine mammal sexes as follows:

1. Examine the genital region of the marine mammal to determine its sex.

2. Record the length, sex, weight (if possible) and species on the Biospecimen Form.

3. Record interaction and sighting information on the Marine Mammal Sighting Form.

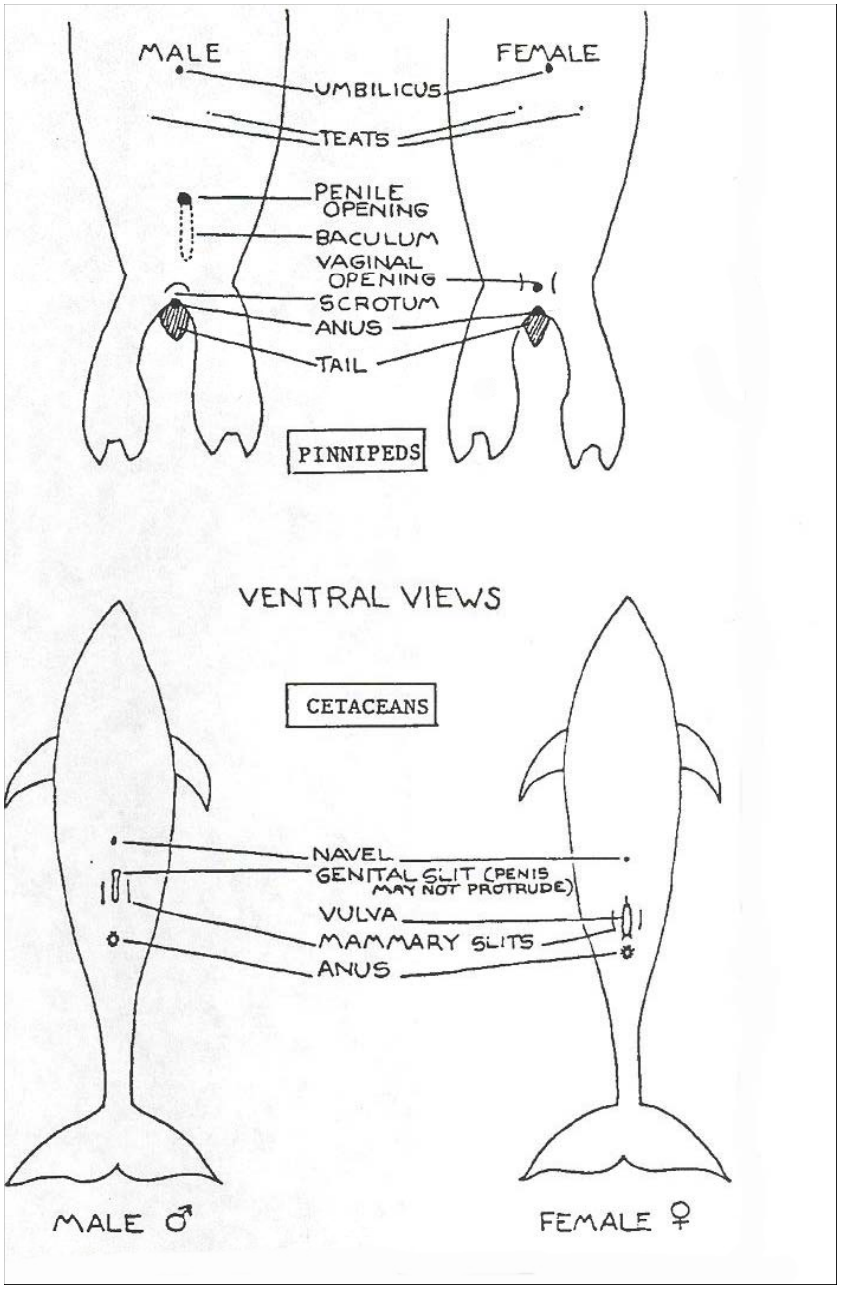


Figure 7-2: Sexing Marine Mammals (NPGOP)

Collecting Canine Teeth from Pinnipeds

If a Steller's sea lion or Northern fur seal is caught and killed or found dead in the fishing gear, the canine teeth of the animal must be collected. Pinniped teeth are used for aging, assessing health and species identification.

The end of the upper snout must be cut off without damaging the root of the canine teeth. The procedure for the collection of canine teeth from a pinniped is as follows:

1. Skin the snout using a sharp knife.

2. The roots of the canine teeth arch back. To ensure that the entire canine root is collected, cut the snout between the second and third post-canine teeth (See Figure 7-3). Use a hacksaw to remove the snout..

3. Preserve the snout by placing it inside three plastic bags and either freezing the specimen or salting it. Never preserve the snout in formaldehyde or alcohol because this will destroy the area of the tooth needed for age reading.

4. Complete a Specimen Collection Label for the snout and include the haul/set retrieval location on the back of the label. The label should have a bar code number on the back, which was affixed under clean, dry conditions. Include the label in the plastic bags with the snout, preferably placed in between the inner bag and the outer bag.

5. Record the length, sex, weight (if possible) and species on the Biospecimen Form. Also record a Dissection Type of "3" for snout and the number from the bar code attached to the back of the Specimen Collection Label.

6. Record interaction and sighting information on the Marine Mammal Sighting Form.

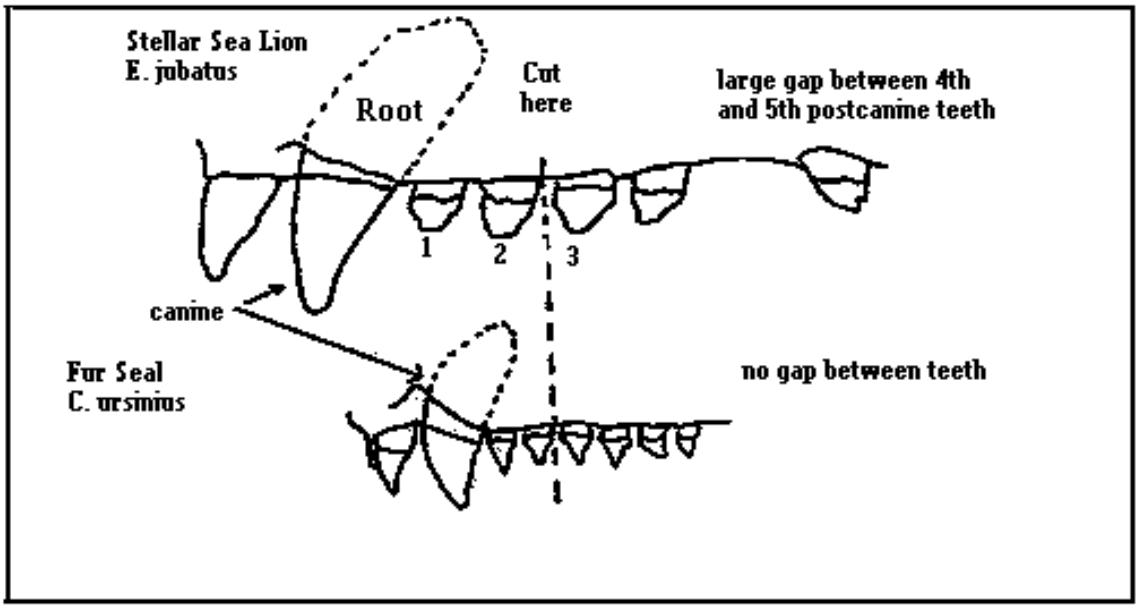


Figure 7-3: Removing Pinniped Canine Teeth

Collecting Tissue from Cetaceans

Genetic information can be used to track and identify cetacean populations. Observers have access to cetacean carcasses and can easily collect tissue samples to be used for this genetic analysis. Skin samples should be taken from all cetacean carcasses, regardless of their condition.

Collect tissue samples from cetaceans using the following procedure:

1. After collecting length and sex data, exchange your fishing gloves for the blue nitrile gloves provided (do not use latex gloves). This is to protect you from disease and DMSO. The nitrile gloves also help protect the tissue sample from DNA

contamination. DNA contamination from any source may compromise the sample.

2. Lightly scrape the sample area on the cetacean clean with a knife to remove fish slime and to reduce potential contamination of the sample. The sample can be collected from anywhere on the animal, but should preferably be taken from the back of the animal just posterior to the dorsal fin.

3. Using a sterile scalpel, cut out a strip of skin approximately 2 cm by 1 cm. Remove any excess blubber from the strip of skin.

4. Place the skin sample in the vial of DMSO provided (see DMSO warning below). Try not to take a large sample, the skin sample must fit in the DMSO vial and be completely covered by the solution. There should be no more than one tissue sample per vial. Store DMSO tissue samples at room temperature. Do not freeze.

5. If DMSO vials are not available, preserve tissue samples using one of the following methods.

    - Place the tissue sample in a sterile otolith vial and freeze it.

    - Place the tissue sample in a sterile otolith vial filled with a saturated salt solution or table salt and store at room temperature.

6. Record the length, sex, weight (if possible) and species on the Biospecimen Form. Also record a Dissection Type of "4" (tissue) and the bar code number from the otolith vial.

7. Record interaction and sighting information on the Marine Mammal Sighting Form.

Warnings about DMSO: Dimethyl Sulfoxide has exceptional solvent properties for organic and inorganic chemicals and is widely used as an industrial solvent. It has also been used to administer drugs topologically. DMSO is able to penetrate intact skin and will carry anything dissolved into it directly in the blood stream. Side affects from DMSO include nausea, headache, and skin rash. Further, since DMSO is a "carrier" chemical, it could deliver harmful substances into the bloodstream if they are present in impure DMSO or on the skin. Great care should be taken when handling DMSO and you should never allow it to come into contact with your skin. **Always wear the nitrile gloves provided when handling DMSO (See Appendix S for more information about DMSO)**.

Collecting Data from Tagged, Branded or Tattooed Marine Mammals

The National Marine Mammal Laboratory and several other state and federal programs have projects tracking marine mammals. To do this they may place a tag, brand, or tattoo on the marine mammal. Radio tags have been affixed to several Stellar sea lions and elephant seals as well as several species of cetacean. Inert ear tags have been placed on several species of pinnipeds. More common are brands and tattoos; usually the brand or tattoo can be found under the flippers or on the belly of the animal.

Collect data from tagged, branded or tattooed marine mammals using the following procedure:

1. If the marine mammal is dead, retrieve the tag and any research instrumentation/attachments affixed to the animal to return to the NMML.

2. If the marine mammal is dead, record the length, sex, weight (if possible), tag number and species on the Biospecimen Form.

3. If the animal is a sea lion or Northern fur seal, collect the canine teeth and record a dissection type of "3" (snout) on the Biospecimen Form. Instructions for collecting pinniped canine teeth are contained earlier in this chapter.

4. If the animal is a cetacean, collect a tissue sample and record a dissection type of "4" (tissue) on the Biospecimen Form. Instructions for collecting cetacean tissue samples are contained earlier in this chapter.

5. For both live and dead marine mammals, record interaction and sighting information on the Marine Mammal Sighting Form. Include the number and description (color, location, etc.) of the tag, brand or tattoo in the notes section.

Marine Mammal Interaction and Sighting Information

Marine mammal interaction and sighting information helps NMML determine the distribution and behaviors of marine mammals. Marine mammal sighting is the lowest priority Observer responsibility. Sighting information should only be collected if it does not interfere with other observer data collection priorities. When collecting marine mammal interaction and sighting information, pay close attention to both the physical characteristics of the animal and to its behavior.

Marine Mammal Physical Characteristics

Below are some general physical characteristics to take note of when collecting marine mammal sighting information.

Cetaceans

- **Body shape** – Robust or slender, small or large?
- **Head shape** – Long or short, definite beak present, bulbous forehead?
- **Dorsal fin shape** – small or large, curvature, location on body?
- **Coloration** – spots, stripes, patches or mottling?
- **Scars and scratch marks** – pieces missing from fins, scratches or dents on body?
- **Orca saddle patches** – note exact size and shape of patch. Take a photo if possible. Researchers are able to identify individual Orcas by their saddle patch.
- **Shape and direction of blow** – bushy or tall blow, single or double blow, blow is straight up or goes forward?

Pinnnipeds

- **Body shape** – Robust or slender, small or large?
- **Head shape** – Long or short snout, ears present?
- **Coloration** – spots, stripes, patches or mottling?
- **Scars and scratch marks** – pieces missing from flippers, scratches on body?

Marine Mammal Behaviors

Animal behavior is useful in assisting with accurate species identification. Descriptions of several standard cetacean and pinniped behaviors are listed below. Watch for these behaviors when collecting marine mammal sighting data.

Small Cetaceans

- **Bow riding**—Animals swim beside the bow or in the bow wave of a moving ship.
- **Leaping entirely out of the water**—Animal jumps fully clear of the surface of the water (as opposed to merely breaking the surface of the water), not for forward locomotion but for other reasons.
- **Porpoising**—Animal raises its body to be nearly or fully out of the water while traveling forward at a fast rate of speed, usually in a fluid, arching motion.
- **Rooster tailing**—Animal surfaces at high speed creating a spray of water in front and over the top of the animal which looks like a rooster's tail. Usually seen only in Dall's porpoise.
- **Slow rolling**—Animal comes to the surface to breathe, with the blowhole and dorsal area usually showing, and then rolls back underwater.

Large Cetaceans

- **Blow visible from a distance**—Blow can be seen from more than 500 meters away. Usually only seen in certain large cetaceans.

- **Breaching**—The whale accelerates forward underwater and then jumps free of the water, sometimes fully clearing the water's surface, and then lands on the surface of the water, creating a large splash. Used for Orca sized cetaceans or larger.

- **Flipper slapping**—Whale floats or swims at the surface, turns on its side and slaps one pectoral fin against the water, either once or several times in quick succession.

- **Group feeding**—Seen primarily in humpback whales, when they coordinate feeding by lunging out of the water with their mouths open, engulfing fish and water.

- **Lob tailing**—Whale raises its tail flukes up out of the water and slaps them down against the surface with great force. This may occur once or be repeated many times.

- **Spy hopping**—Whale is vertical or upright in the water and raises its head up out of the water, usually with its eye showing.

- **Tail raised on dive**—When diving, the whale's entire tail lifts completely above the water before going underwater.

- **Side and stern wake riding**—Whale is riding in the wake created amidships along the side of the vessel, or the wake created by the stern.

Pinnipeds

- **Jug handle**—Seal or sea lion floats on its side with one front flipper and one rear flipper above the water, creating what looks like a handle.
- **Porpoising**—Pinniped is swimming fast, jumping at least partially out of the water in fluid, arching motions. This swimming pattern resembles that of dolphins or porpoises seen at a distance.
- **Rafting**—A group of pinnipeds resting at the surface together.
- **Spooked from haulout**—Pinnipeds which had been resting on a beach, rocks or ice dove into the water due to your vessel's interaction with them
- **Vocalizing**—Pinniped making directed noises at you or at another pinniped.

Marine Mammal Data Collection Forms

There are three forms to use when collecting marine mammal information.

1. Biospecimen Form.
   - Use this form to record length, sex, and weight information from dead marine mammals.
   - Use this form anytime canine teeth or a tissue sample is collected from a dead marine mammal.
2. Marine Mammal Sighting Form.
   - Use this form to record marine mammal interaction or sighting information.

3. Specimen Collection Label.

    - Use this form to record data when sea lion or Northern fur seal canine teeth (snouts) have been collected.

The Marine Mammal Sighting Form should be completed whether or not the marine mammal is alive or dead and whether the animal has been brought on board the fishing vessel or not. The Biospecimen Form only needs to be completed for dead marine mammals onboard a fishing vessel.

Biospecimen Form Instructions

Complete the Biospecimen Form any time length, sex or weight information is collected from a dead marine mammal. Also complete this form if canine teeth or tissue samples have been collected. An example of the form is included as Figure 7-4.

- **Haul Number –** Record the number of the haul that the marine mammal came from.
- **Date –** Record the date as MM/DD/YY.
- **Trip Number –** Record the trip number generated by the database system.
- **Coast Guard Number –** Record the USCG vessel number on limited entry trawlers and fixed gear vessels (if they have one). Do not record anything in this field if you are on an open access vessel or a limited entry fixed gear vessel that does not have a USCG number.
- **Catch # -** Record the number that corresponds to the catch category on the Catch Form.

- **Catch Category –** Record in capital letters the catch category the species is in as recorded on the Catch Form.

Tip* - Marine mammals are usually sampled as their own Catch Category (ZMRM).

- **R or D –** Record whether the sample came from an **R** – Retained or **D** – Discarded catch category.

- **Species Name -** Record the **common name** of the species. This column must be filled in with the species name. Do not only enter the species code! The common name listed on the paperwork must match the common name used in the database.

- **Species Code** - Record the species code of the corresponding species. See Appendix C for a list of marine mammals and species codes.

- **Method –** Record the Biospecimen Sampling Method used.

  6 - Outside and Nonrandom
  7 - Outside and Random
  8 - Inside and Nonrandom
  9 - Inside and Random

- **Sex –** Record **M** – Male, **F** – Female, or **U** – Unknown (individuals where the sex cannot be determined). If you did not attempt to sex the individual, LEAVE COLUMN BLANK.

- **Viabilities –** Do not record viability information for marine mammals.

- **Length –** Record the length of the marine mammal in centimeters.

- **Weight –** Record the weight of the marine mammal in pounds.

- **Maturity Stage** – Do not record maturity stage information for marine mammals.

- **Dissection Type –** Record the type of dissection that was taken.

  1 – Otoliths
  2 – Scales
  3 – Snout
  4 – Tissue

- **Barcode Number –** Record the barcode number of the vial, envelope, or other container that the dissected part was placed in.

- **Tag Number –** Record the tag number if the individual was tagged.

- **Comments –** Document any important information regarding the marine mammal.

- **KP Length –** Sum up all of the length **by species** and note total of all lengths in the KP Length (keypunch length) column.

- **KP Frequency -** Sum up all of the frequencies **by species** and note total of all frequencies in KP Freq (keypunch frequency) column.

Haul # ☐☐ Page ____ of ____

Date ☐☐☐☐☐☐ Trip Number ☐☐☐☐☐ USCG # ☐☐☐☐☐☐☐

Catch #	Catch Category	R or D	Species Name	Species Code	Method	Sex	KP Length / KP Freq.	Weight	Length	Viability	Maturity stage	Dissection Type	Barcode #	Tag #	Comments

Method : 1-Outside and Nonrandom 2-Outside and Random 3-Inside and Nonrandom 4-Inside and random

Dissection Type: 1 - Otoliths 2 - Scales 3 - Snouts 4 - Tissue

Biological Sampling Form v.3
January 2004

Figure 7-4: Biospecimen Form

Specimen Collection Label Instructions

Complete the Specimen Collection Label when a pinniped snout has been collected. An example of the form is included as Figure 7-5.

- **Vessel Name** – Record the name of the vessel on which the specimen was collected.
- **Haul Number** – Record the haul number from which the specimen was collected.
- **Trip Number** – Record the trip number generated by the database system.
- **Date** – Enter the date that the haul/set was retrieved as MM/DD/YY.
- **Species Identification** – Record the common name of the species.
- **Entered As** – Record the species name entered into the database, if this differs from the above.
- **Depth (FM)** – Record the retrieval depth of the haul/set in fathoms.
- **Length (cm)** – Record the length of the marine mammal in centimeters.
- **Weight (LB)** – Record the weight of the marine mammal in pounds.
- **Sex** – Record the sex of the marine mammal.
- **Observer Name** – Record your first and last name.

SPECIMEN COLLECTION LABEL
West Coast Groundfish Observer Program
DOC/NOAA/NMFS/NWFSC/FRAMD
2725 Montlake Blvd. Seattle, WA 98112
(use pencil ONLY!)

VESSEL NAME_____ HAUL NUMBER_____
TRIP NUMBER_____ DATE_____
SPECIES IDENTIFICATION_____
ENTERED AS_____
DEPTH(FM)_____ LENGTH(CM)_____
WEIGHT(LB)_____ SEX (if applicable)_____
OBSERVER NAME_____

Figure 7-5: Specimen Collection Label

Marine Mammal Sighting Form Instructions

Complete the Marine Mammal Sighting Form for marine mammal interaction and sighting information. Fill out the form as completely as possible. The more information you provide, the more useful the data is to NMML in determining species ranges and documenting interactions. An example of the form is included as Figures 7-6 and 7-7.

- **Observer –** Record your first and last name.
- **Vessel** – Record the name of the vessel.
- **Date** - Record the date as YY – MM - DD.
- **Time** - Record the time that the marine mammal was first seen in military time HH:MM.

- **Latitude** - Record the latitude (in degrees, minutes, 1/10th of a minute) where the marine mammal was first seen.

- **Longitude** - Record the longitude (in degrees, minutes, 1/10th of a minute) where the marine mammal was first seen. Record a "W" (west) in the box following the longitude.

- **General Location of Vessel** – Record a brief description of the vessel's general location. This field is optional.

- **Sighting Conditions** - Record a check mark in the box that best describes the overall sighting conditions (excellent, good, fair, poor).

- **Beaufort** – Record the Beaufort sea condition value. A description of each Beaufort value is listed on the back of the form.

- **Surface Water Temperature** - Record surface water temperature in degrees centigrade.

  Tip* - The surface water temperature can often be obtained from the skipper as many new sonars, plotters, and net detectors record the surface water temperature.

- **Species** – Record the common name of the species. Do not enter the species code!

- **Confidence** – Record a check mark in the box that best describes your confidence (sure, likely, unsure) in your species identification.

- **Sighting Cue** - Note what the marine mammal did to attract attention.

- **Closest approach** - Note the distance in meters of the closest approach of the marine mammal to the vessel.

- **Number Sighted Best** - Record the best estimate overall of the number of individuals observed.

- **Number Sighted Minimum** – Record the best estimate of the minimum number of individuals observed.

- **Number Sighted Maximum** – Record the best estimate of the maximum number of individuals observed.

- **Body Length Estimate** – Record a check mark in the box that best describes the length of the individual(s) observed.

- **Behaviors Seen** - Circle all of the behaviors observed during the sighting.

- **Narrative and Sketches –** Record physical and behavioral information about the animal(s). This section is the most important section of the form and should be completed as fully as possible. A short list of key features to note is listed below.

  General size and shape of the body
  Size and shape of the snout
  Color patterns on the fins and body
  Size and shape of the tail and flippers
  Scars and scratch marks
  Size and shape of dorsal fin and its position on the body
  Shape and direction of blow
  Location of the blowhole
  Animal behaviors

- **Fishing Interactions –** Circle all of the interactions observed between the marine mammal and the fishing vessel.

- **Photos/ Video** – Record the bar code number from the disposable camera and the frame number of the picture.

- **Trip number -** Record the trip number generated by the database system.

- **Federal Groundfish Permit Number -** Record the Groundfish Permit number if the vessel has one.

Tip* - The Federal Groundfish Permit Number can be found on the online database, under Vessels – Vessel Information.

- **Coast Guard Document #** - Record the USCG vessel number on limited entry trawlers and fixed gear vessels (if they have one). Do not record anything in this field if you are on an open access vessel or a limited entry fixed gear vessel that does not have a USCG number.

- **Silhouettes** – On the back of the Marine Mammal Sighting Form, circle the silhouette of the marine mammal, which looks the most, like the marine mammal observed.

Form WCOP

MARINE MAMMAL SIGHTING

NOAA/NMFS/AFSC/NMML
Platforms of Opportunity
7600 Sand Point Way NE
Seattle, WA 98115

Observer(s)_____ Vessel_____

year month day local time (24 hr. clock) +/-

latitude ° ' N/S N general location of vessel (optional)

longitude 1 ° ' E/W sighting conditions (xlnt good fair poor) Beaufort +/- water temp. °C

species (common and/or scientific name) **Please fill out a form for each species** confidence (sure likely unsure)

sighting cue

closest approach (means) number sighted (best) number (minimum) number (maximum)

For Office Use Only

observer

platform vis. species conf.

sighting cue photos roll frames

behaviors, cues and interactions

behaviors, cues and interactions length multi

Narrative

Make identifications only on specific features seen. Mention them here. Include body features, markings and coloration, associated organisms, elaborate on behaviors, etc. The most valuable sightings contain a good amount of detailed information.

Body Length Estimate

- ☐ < 3 m (< 10')
- ☐ 3-8 m (10-25')
- ☐ 8-16 m (25-50')
- ☐ 16-26 m (50-80')
- ☐ >26 m (>80')

Sketches

When possible, make a sketch noting pigmentation, anatomical features, scarring, posture, anatomical anomalies, group positioning, etc.

Some common behaviors
(circle these or add your own in narrative section)

Small cetaceans
Bow riding
Leaping entirely out of water
Porpoising (swimming fast, body out of the water)
Rooster-tailing (usually a Dall's porpoise cue)
Slow rolling

Large cetaceans
Blow visible from a distance
Breaching
Flipper slapping
Group feeding
Lob-tailing
Spy-hopping
Tail raised on dive
Side wake riding
Stern wake riding

Pinnipeds
Jug handle (flippers in air)
Porpoising (swimming fast, at least partially out of the water)
Rafting
Spooked from haulout
Vocalizing

Fishing Interactions

Feeding on discards	Killed by gear
Feeding from gear	Killed by propeller
Feeding on catch	Previously dead
Contact with vessel	Lethal removal (trailing gear)
Contact with gear	Lethal removal (not trailing gear)
Trailing gear	Entangled in gear (not trailing gear)
Deterrence used	Entangled in gear (trailing gear)
Boarded vessel	Other
Swimming near gear	Unknown

Photos/Video (optional)
☐ photographs
☐ video

roll/tape # _____

frame(s) _____

☐ **Check here if there was more than one species of marine mammal present at this sighting.**

trip number Federal Groundfish permit number Coast Guard document #

See silhouettes on other side

Form WCOP: ver.VIII.2001: Balla, Harkness, Hill, Folkens, Lowell, LaFargue, Mizroch

Figure 7-6: Marine Mammal Sighting Form – Front

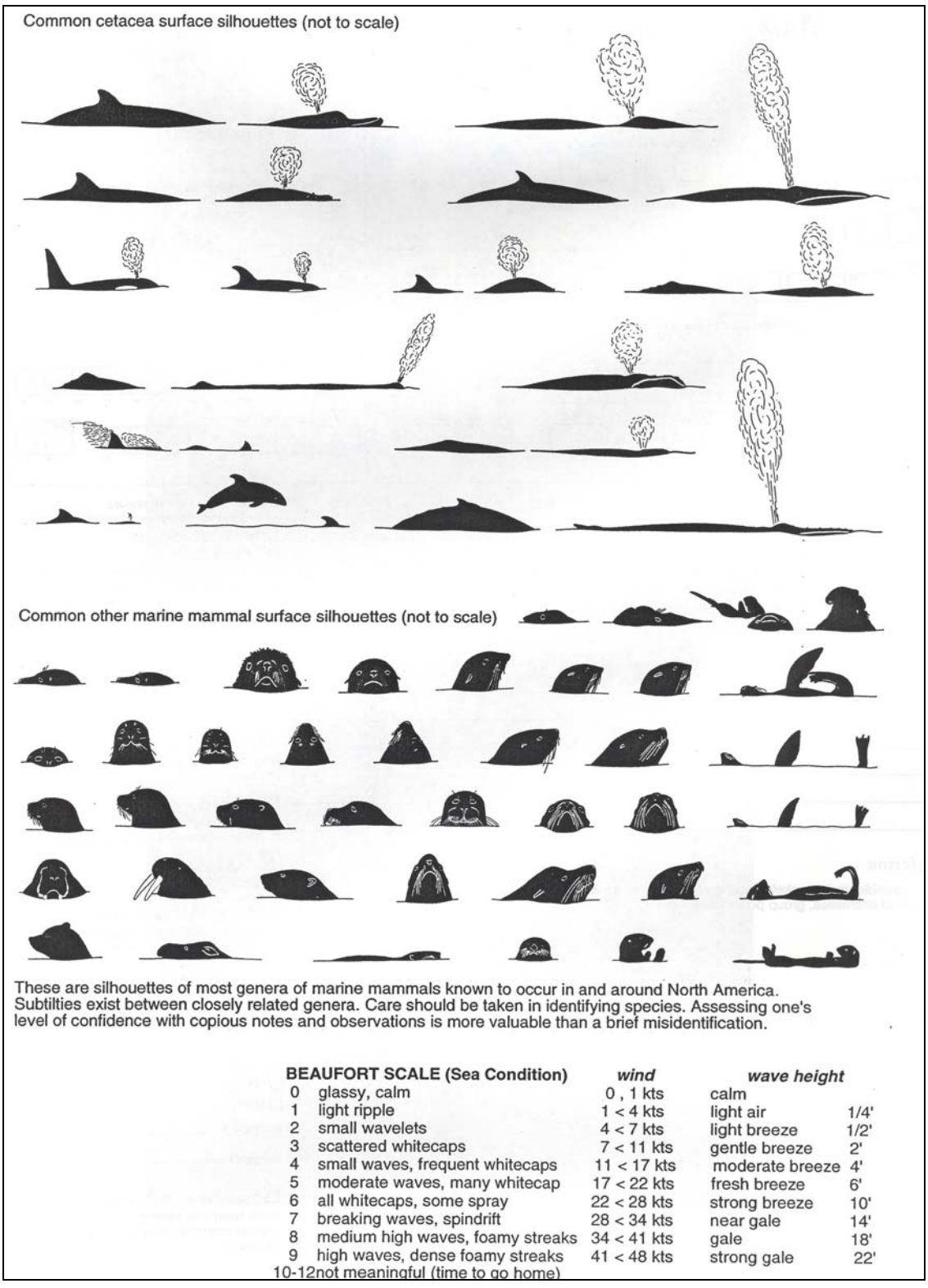


Figure 7-7: Marine Mammal Sighting Form – Back

II. Seabirds

Introduction

It is estimated that somewhere between 300,000 and a million seabirds are killed annually by commercial fishing gear worldwide. Very little information is collected on seabird bycatch in the majority of commercial fisheries, making it extremely difficult to accurately estimate mortality rates or to predict the long term effects of fishing on seabird populations. The National Marine Fisheries Service and the U.S. Fish and Wildlife Service (USF&WS) are currently cooperating to obtain information on the mortality of seabirds in the West Coast groundfish fisheries. Data collected by Observers provides valuable information on seabird mortality and is crucial for the management of seabirds by the USF&WS, which analyzes each year's incidental mortality and its effect on the health of seabird populations.

Not all incidental seabird mortality is caused by fishing gear interactions. Incidental mortality can also result from birds colliding with vessels. Incidents range from the occasional bird found on deck to flocks of birds hitting the ship, often referred to as "bird storms." Birds hit the vessel because they become disoriented, primarily at night during inclement weather and when bright lights are being used. Observers are one of the few sources of data on this kind of mortality.

Observer data also provides a valuable source of information on banded birds. Every year the U.S. Fish and Wildlife Service, the Canadian Wildlife Service, state wildlife management agencies, and provincial wildlife management agencies band about 300,000 migratory game birds. Approximately 700,000 non-game birds are banded annually by Management agencies, ornithological institutions, researchers, and private individuals. Recovery of banded birds is important to the management of migratory birds. The Bird Banding Laboratory (BBL) of the

U.S. Geological Survey and the Banding Office of the Canadian Wildlife Service jointly manage the bird-banding program in North America. Analysis of banding data allows calculation of important population parameters such as survival rates and harvest rates. The calculation of harvest rates is one of the most important uses of banding data. Of all the banded birds recovered, only 30-40% are reported to the BBL. Given the tremendous cost associated with the banding effort and the reliance on banding as an essential management and research tool, the loss of data associated with this low band-reporting rate is regrettable.

Seabird Data Collection Priorities

Due to potential data collection time constraints, Observers are asked to prioritize the collection of seabird information by species and information taken.

Seabird data collection in order of priority:

1. Endangered Species
   - Document all takes.
   - Document any sightings.

2. Threatened Species
   - Document all takes.
   - Document all sightings.

3. Banded Birds
   - Document all takes.
   - Document sightings as time permits.

4. Other Seabird takes
   - Always document all takes that occur within a species composition sample.
   - Document takes outside of species composition samples as time permits.

Endangered, Threatened and Banded Seabirds

There are three seabird species listed as endangered and one listed as threatened, hereafter referred to as 'species of interest', which may be encountered while observing in the West Coast groundfish fisheries. When documenting takes or sightings of species of interest or banded individuals of any species, be sure to include a thorough description including size, plumage color, description of bill, and any other distinguishing characteristics.

Endangered Species

- Short-Tailed Albatross
  In 2001, the population estimate for short-tailed albatross was approximately 1600 individuals. These birds occur offshore and are the most likely of the three endangered species to come in contact with commercial fishing gear.

- California Brown Pelican
  California Brown Pelicans are generally sighted inshore. These birds are not likely to be taken by commercial groundfish gear.

- California Least Tern
  California Least Tern are generally sighted inshore. These birds are not likely to be taken by commercial groundfish gear.

Threatened Species

- Marbled Murrelet
  Most incidental takes of Marbled Murrelets occur in gillnet fisheries.

Banded Birds

- Most seabirds will be banded with uniquely coded metal or plastic leg bands.

- Nasal markers or radio tags may also be seen.

Seabird Data Collection Procedures

Information on the incidental take of seabirds is critical and this data should be collected whether the seabird is part of a species composition sample or not. Incidental takes are always recorded on the Seabird Sighting Form and if the seabird is part of a species composition sample the data is recorded on the Species Composition Form as well.

Seabird sighting and interaction data for endangered, threatened or banded birds is also a high priority and this data should be collected whenever possible.

Collecting Species Composition Information

Information on the incidental take of seabirds is primarily accomplished as part of species composition sampling. Instructions for species composition sampling on trawlers are detailed in Chapter 4 while instructions for species composition sampling on fixed gear vessels are detailed in Chapter 5. Supplement the instructions provided in these chapters with the seabird data collection protocol below.

Collect species composition information for seabirds as follows:

1. Identify each bird to the species level whenever possible. If the species cannot be determined,

identify birds to the highest taxonomic level possible.

2. If the bird has leg bands, nasal tags, or radio tags, collect the tags being careful not to damage any identifying information printed on them. If there are multiple leg bands, try to note which color band is on which leg as this will often identify particular individuals.

3. Weigh each seabird species individually (remember to drain as much water as possible from the carcasses). Birds are much lighter than they appear. Individual bird weights over 2.3 lbs. are extremely doubtful!

4. If birds drop off of longline gear or are thrown overboard before being weighed, identify them as best possible and use an average weight from hauls where an actual weight was obtained for that species or group. If no other birds were caught from this group, visual estimate the weight as closely as possible. Remember, birds look much heavier than they really are.

5. If there is an actual weight for the seabird species, record common name, species code, number taken, and weight information on the Species Composition Form. The WCGOP codes for each species or species group can be found on the Seabird Species List (Appendix D).

6. If there is only a visual estimated weight for the seabird species, create a new ZBRD Catch Category on the Catch Form. Record the estimated weight, a weight method of 4 - Visual Estimate and write the species name in the comments section.

7. Complete a Seabirds Sighting Form for each species of seabird encountered. In the notes section, include all information from the band or tag if one was collected.

8. If a species of interest is taken, notify NMFS immediately. Do NOT wait until debriefing. Take photos of the bird to verify identification if possible.

Collecting Seabird Interaction and Sighting Information

Incidental seabird takes are the primary vessel interaction data of interest to scientists. Incidental takes may result from seabird interactions with fishing gear, seabirds' collisions with the vessel or from intentional killings. Collect seabird take data whenever possible.

In addition, collect sighting and interaction information on seabird species of interest. This data helps researchers track seabird populations and helps provide some insight into seabird / vessel interactions.

If the birds are alive, note any bands or tags, and release them (many species are unable to fly off of a deck and will need to be dropped over the rail). Note that thoroughly wet birds cannot fly or keep themselves warm. If possible, they should be allowed to dry out in a sheltered spot before being released.

Collect seabird take, interaction and sighting information as follows:

1. Identify each bird to the species level whenever possible. If the species cannot be determined, identify birds to the highest taxonomic level possible. Record key features (color, size, etc.) in the notes section of the Seabird Sighting Form.

2. Note seabird behavior and any contact with the vessel or the vessel's gear. Record key behaviors in the notes section of the Seabird Sighting Form.

3. If the bird has leg bands, nasal tags, or radio tags, note placement, color, and any other characteristics that might help to identify the tag. If there are multiple leg bands, try to note which color band is on which leg as this will often identify particular individuals.

4. Complete a Seabird Sighting Form for each seabird species encountered.

Seabird Data Collection Forms

There are two forms to use when collecting seabird information.

1. Species Composition Form

   - Use this form to record seabird weights and numbers for seabirds encountered in species composition samples. Refer to chapters 4 or 5 for instructions on completing this form.

2. Seabird Sighting Form

   - Use this form to record all seabird takes.

- Use this form to record seabird interaction and sighting information.

Seabird Sighting Form Instructions

All incidental seabird takes and sightings of species of interest or banded birds must be recorded on a Seabird Sighting Form. An example of the form is included as Figure 7-8.

- **Trip Number –** Record the trip number generated by the database system.
- **USCG #** – Record the USCG vessel number on limited entry trawlers and fixed gear vessels (if they have one). Do not record anything in this field if you are on an open access vessel or a limited entry fixed gear vessel that does not have a USCG number.
- **Observer Name –** Record your first and last name.
- **Vessel Name –** Record the name of the vessel.
- **Date** – Record the date as DD/MM/YY.
- **Time** – Record the time that the seabird was first seen in military time HH:MM.
- **Sighting Conditions –** Place a check mark next to the description that best describes the overall sighting conditions (excellent, good, fair, poor).
- **Latitude** - Record the latitude (in degrees, minutes, $1/10^{th}$ of a minute) where the seabird was first seen.
- **Longitude** - Record the longitude (in degrees, minutes, $1/10^{th}$ of a minute) where the seabird was first seen.
- **Beaufort Scale** – Record the Beaufort sea condition value. A description of each Beaufort

value is listed on the back of the Marine Mammal Form.

- **Surface Water Temperature** - Record surface water temperature in degrees centigrade.

  Tip* - The surface water temperature can often be obtained from the skipper as many new sonars, plotters, and net detectors record the surface water temperature.

- **Species** – Record the common name of the species. Do not enter the species code! A Seabird Species List is included as Appendix D.

- **Confidence** – Place a check mark next to the description best describes your confidence (sure, likely, unsure) in your species identification.

- **Closest approach** - Note the distance in meters of the closest approach of the seabird to the vessel.

- **Number Sighted Best** - Record the best estimate overall of the number of individuals observed.

- **Number Sighted Minimum** – Record the best estimate of the minimum number of individuals observed.

- **Number Sighted Maximum** – Record the best estimate of the minimum number of individuals observed.

- **Fishing Interactions -** Circle the fishing interactions that best describe the interaction between the bird and the vessel.

- **Notes –** Include as much detail as possible about the sighting/interaction. Always include a thorough description of the bird, including size, plumage

color, description of bill, and any other distinguishing characteristics used for identification as well as descriptions and locations of all bands.

SEABIRD SIGHTING FORM

Trip Number ☐☐☐☐☐☐ **USCG #** ☐☐☐☐☐☐☐

Observer _____ **Vessel** _____

Date ☐☐ ☐☐ ☐☐ MM/DD/YY

Time ☐☐:☐☐ HH:MM

Sighting Condition

☐ Excellent ☐ Fair

☐ Good ☐ Poor

Latitude ☐☐° ☐☐.☐ N

Longitude 1☐☐° ☐☐.☐ W

Beaufort Scale ☐

Water Temp ☐☐ ° C

Species (Common Name): _____

Confidence ☐ Sure ☐ Likely ☐ Unsure

Body Length < 3 m (10 feet)

Closest Approach	Number Sighted (Best)	Number (Min)	Number (Max)
☐☐☐☐ M	☐☐☐☐	☐☐☐☐	☐☐☐☐

Notes

Fishing Interactions

1 - Feeding on Discards
2 - Feeding from Gear
3 - Feeding on Catch
4 - Contact with Vessel
5 - Contact with Gear
6 - Trailing Gear
7 - Deterrence Used
8 - Boarded Vessel
9 - Swimming near Gear
10 - Killed by Gear
11 - Killed by Propeller
12 - Previously Dead
13 - Lethal removal (trailing gear)
14 - Lethal removal (not trailing gear)
15 - Entangled in Gear (not trailing gear)
16 - Entangled in Gear (trailing gear)
17 - Other
18 - Unknown

(circle all that apply)

February 2004

WCGOP Seabird Form v.1

Figure 7-8: Seabird Sighting Form

III. Sea Turtles

Introduction

Five species of sea turtles inhabit the waters off the West Coast of the United States. Observers collect species, size and condition information from the seas turtles they encounter. Other scientists record data on the movements and preferred habitats of the various populations of sea turtles. These data are critical to the development of conservation and recovery strategies for these marine reptiles.

Sea Turtle Data Collection

It is unlikely that a turtle will be caught in a groundfish trawl or on a fixed longline. In the rare event that a sea turtle is encountered, collect the following information:

1. Identify the sea turtle to species. Figure 7-9 is a sea turtle identification flow chart for Eastern Pacific Marine Turtles.

2. To identify the sea turtle, collect the following information:

    - Count the number of costal scutes on the left side of the carapace.

    - Count the number of costal scutes on the right side of the carapace.

    - Count the number of scutes on the midline of the carapace.

    - Count the number of scutes on either side of the plastron.

    - Check to see if there are overlapping scutes on the dorsal surface.

- Check to see if there are pores on the ventral inframarginal scutes.
- Check to see if the turtle has one pair of prefrontal scales.
- Check to see if the turtle lacks a bony shell.
- Check the dorsal coloration of the turtle.

3. Determine the carapace length by measuring the distance between the center edge of the nuchal scute and the posterior edge of the carapace, following the curvature of the dorsal center line. If there is a notch between the two posterior marginal scutes, measure the distance to the rear most point of the scutes. For turtles with a keel running down the center of the carapace (leatherbacks, and juvenile olive ridleys and loggerheads), measure to one side of the median keel, not on top of it.

4. Determine the carapace width by measuring the maximum distance between the lateral edges of the carapace. Measure over the curvature of the shell.

5. Determine the tail length by measuring the distance between the posterior most point of the carapace and the tip of the tail. If the stretched tail does not extend beyond the carapace, the length is "0000".

6. Note the condition of the turtle as follows:

   - **Previously Dead** – The turtle was already dead when it was sighted or captured.
   - **Released Unharmed** – The turtle was returned to the sea alive and uninjured.
   - **Released Injured** – The turtle was injured as a result of fishing operations, or by vessel personnel.

"Injured" is an animal removed from the gear with obvious physical injury or with gear attached.

- **Killed Accidentally** – The turtle died due to injuries incurred during fishing operations, or was returned to the sea while comatose.
- **Escaped** – The turtle left the gear or deck unaided after capture or entanglement, with no apparent injuries.
- **Treated as Catch** – The turtle was not previously dead and was sacrificed for market, table or other use.
- **Other/Unknown** – The final fate of the turtle involved in the haul/set is unknown or whose condition after leaving the gear or deck was unobserved.

7. Look for tags and record all data from the tag. If the turtle is dead, remove the tag.
8. Take one photo of the head and several additional photos of different angles of the whole turtle showing the costal and vertebral scutes.
9. Record all data on the Sea Turtle Life History Form.

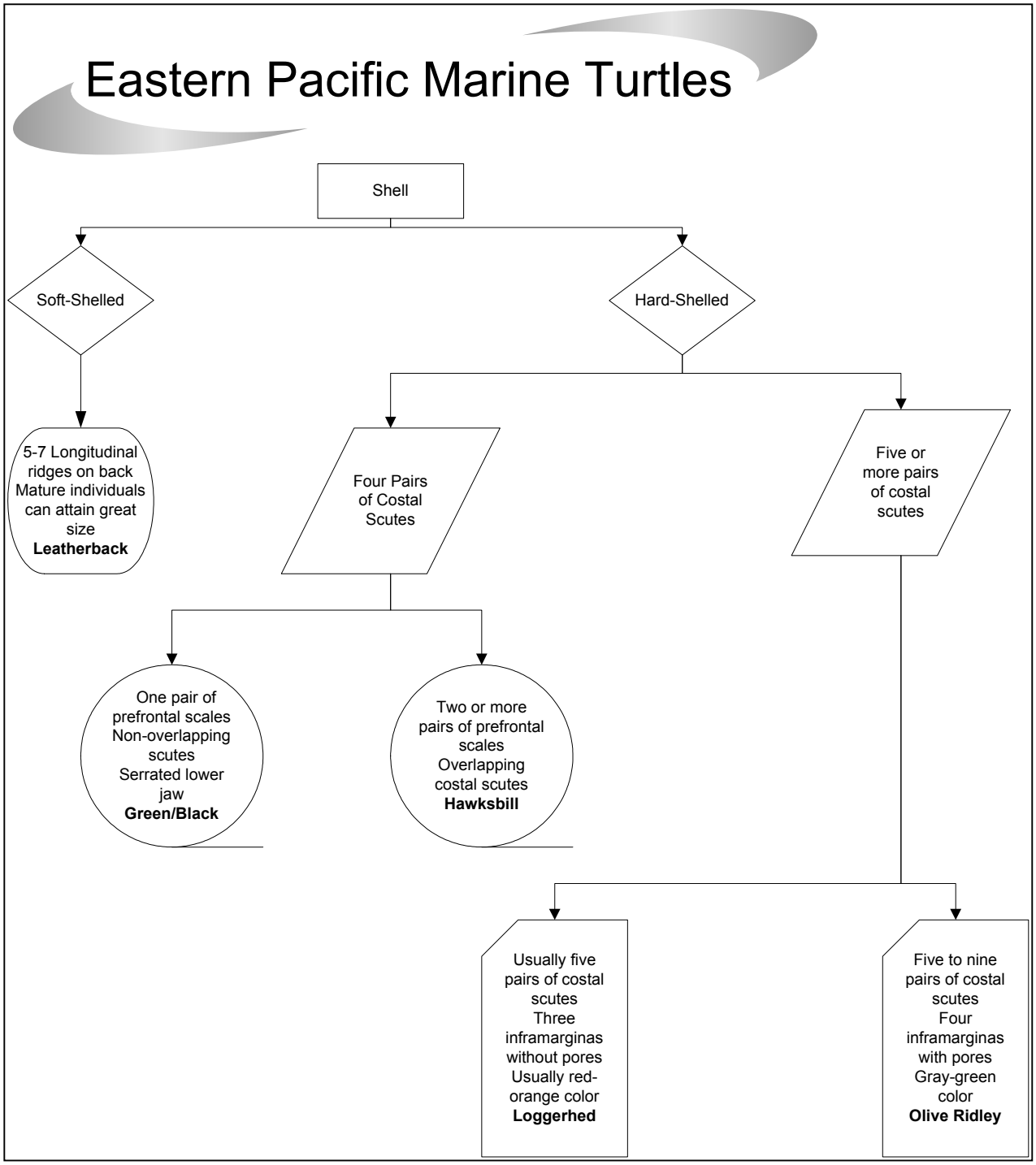


Figure 7-9: Sea Turtle ID Flow Chart

Sea Turtle Life History Form Instructions

The "Gill Net Sea Turtle Life History Form" has been borrowed from the NMFS South West Region Drift Gillnet Observer Program and should be completed for all sea turtles encountered. An example of the form is included as Figures 7-10 and 7-11.

Header

- **Trip Number** – Record the trip number generated by the database system.
- **Specimen** – Leave this field blank.
- **Date** – Record as YY – MM – DD.
- **Set #** - Record the haul or set number.
- **Latitude** – Record the haul/set retrieval latitude as degrees (two digits) and minutes (two digits).
- **Longitude** – Record the haul/set retrieval longitude as degrees (three digits) and minutes (two digits).
- **Species** – Record the two letter species code for the turtle.

  LV – Olive Ridley
  ET – Hawksbill
  CM – Green/Black
  CC – Loggerhead
  DC – Leatherback
  UT – Unidentified

Identification

- **Left Costal Scutes** – Record the scute count.
- **Right Costal Scutes** – Record the scute count.
- **Vertebral Scutes** – Record the scute count.
- **Inframarginal Scutes** – Record the scute count.
- **Overlapping Scutes** – Record a 1 for yes, 2 for no, or 3 for unknown.
- **Inframarginal Pore** - Record a 1 for yes, 2 for no, or 3 for unknown.
- **1 Pair of Prefrontal Scales** – Record a 1 for yes, 2 for no, or 3 for unknown.
- **Lacks Bony Shell** - Record a 1 for yes, 2 for no, or 3 for unknown.
- **Dorsal Coloration** – Record a 1 for orange/red, 2 for grayish, or 3 for other/unknown.

Dimensions

- **Carapace Length** – Record the length to the nearest tenth of a centimeter.
- **Carapace Width** – Record the length to the nearest tenth of a centimeter.
- **Tail Length** - Record the length to the nearest tenth of a centimeter.

Condition of Turtle

- Enter the number of the description that best represents the condition of the turtle.

1 - Previously dead	5 - Escaped from net
2 - Released unharmed	6 - Treated as catch
3 - Released injured	7 - Other/unknown
4 - Killed accidentally	

- **Describe Any Injuries** – Provide notes on any injuries or on the general condition of the turtle. If notes are made, record a 1 for yes. Otherwise, record a 2 for no.

- **Photos Taken** – Record a 1 for yes or 2 for no. Record the camera bar code and frame numbers in the comments section.

- **Samples Collected** – Record 2 for no. At this time we are not collecting ANY samples from turtles.

Position In Net

- **Horizontal** - Leave this field blank.

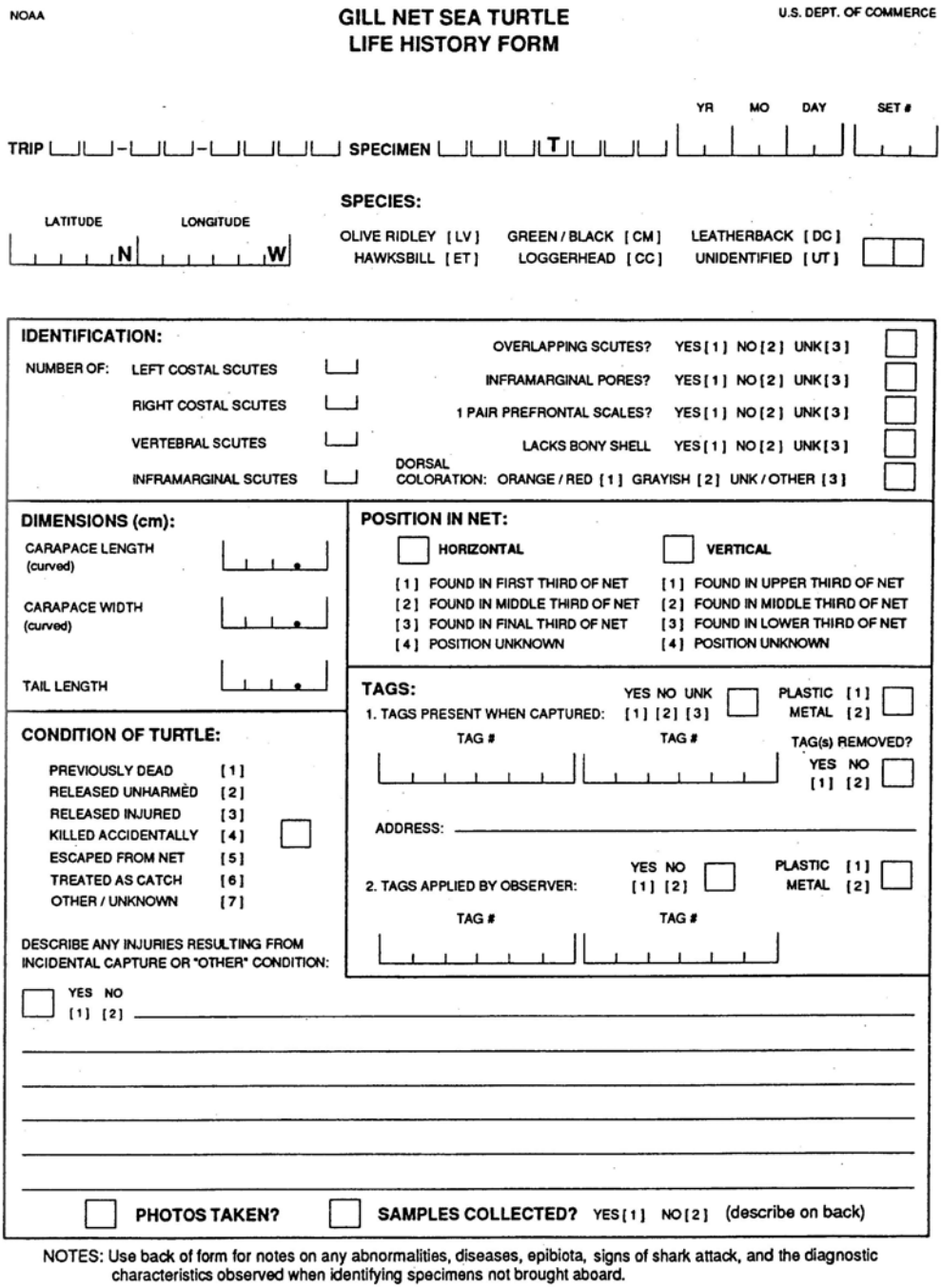
- **Vertical** - Leave this field blank.

Tags

- **Tags Present When Captured** – If a tag is present, record a 1 for yes and the additional information below. If a tag is not present, record 2 for no.

  Tag # - Record the tag number(s).
  Tag Type – Record a 1 for plastic or 2 for metal.
  Tag(s) Removed – Record a 1 for yes or 2 for no.
  Address – Print the return address on the tag(s).

- **Tags Applied By Observer** – Leave this section blank.



NOAA

GILL NET SEA TURTLE LIFE HISTORY FORM

U.S. DEPT. OF COMMERCE

TRIP ⌊⌋⌊⌋-⌊⌋⌊⌋-⌊⌋⌊⌋⌊⌋⌊⌋ SPECIMEN ⌊⌋⌊⌋⌊⌋T⌊⌋⌊⌋⌊⌋ YR ⌊⌋⌊⌋ MO ⌊⌋⌊⌋ DAY ⌊⌋⌊⌋ SET # ⌊⌋⌊⌋⌊⌋

LATITUDE ⌊⌋⌊⌋⌊⌋N⌊⌋ LONGITUDE ⌊⌋⌊⌋⌊⌋W⌊⌋

SPECIES:

OLIVE RIDLEY [LV] GREEN / BLACK [CM] LEATHERBACK [DC]
HAWKSBILL [ET] LOGGERHEAD [CC] UNIDENTIFIED [UT] ☐☐

IDENTIFICATION:

NUMBER OF: LEFT COSTAL SCUTES ⌊⌋
RIGHT COSTAL SCUTES ⌊⌋
VERTEBRAL SCUTES ⌊⌋
INFRAMARGINAL SCUTES ⌊⌋

OVERLAPPING SCUTES? YES [1] NO [2] UNK [3] ☐
INFRAMARGINAL PORES? YES [1] NO [2] UNK [3] ☐
1 PAIR PREFRONTAL SCALES? YES [1] NO [2] UNK [3] ☐
LACKS BONY SHELL YES [1] NO [2] UNK [3] ☐
DORSAL COLORATION: ORANGE / RED [1] GRAYISH [2] UNK / OTHER [3] ☐

DIMENSIONS (cm):

CARAPACE LENGTH (curved) ⌊⌋⌊⌋⌊⌋.⌊⌋
CARAPACE WIDTH (curved) ⌊⌋⌊⌋⌊⌋.⌊⌋
TAIL LENGTH ⌊⌋⌊⌋⌊⌋.⌊⌋

POSITION IN NET:

☐ HORIZONTAL ☐ VERTICAL

[1] FOUND IN FIRST THIRD OF NET [1] FOUND IN UPPER THIRD OF NET
[2] FOUND IN MIDDLE THIRD OF NET [2] FOUND IN MIDDLE THIRD OF NET
[3] FOUND IN FINAL THIRD OF NET [3] FOUND IN LOWER THIRD OF NET
[4] POSITION UNKNOWN [4] POSITION UNKNOWN

TAGS:

1. TAGS PRESENT WHEN CAPTURED: YES NO UNK [1] [2] [3] ☐ PLASTIC [1] METAL [2] ☐
TAG # ⌊⌋⌊⌋⌊⌋⌊⌋⌊⌋⌊⌋ TAG # ⌊⌋⌊⌋⌊⌋⌊⌋⌊⌋⌊⌋ TAG(s) REMOVED? YES NO [1] [2] ☐

ADDRESS: _____

2. TAGS APPLIED BY OBSERVER: YES NO [1] [2] ☐ PLASTIC [1] METAL [2] ☐
TAG # ⌊⌋⌊⌋⌊⌋⌊⌋⌊⌋⌊⌋ TAG # ⌊⌋⌊⌋⌊⌋⌊⌋⌊⌋⌊⌋

CONDITION OF TURTLE:

PREVIOUSLY DEAD [1]
RELEASED UNHARMED [2]
RELEASED INJURED [3]
KILLED ACCIDENTALLY [4] ☐
ESCAPED FROM NET [5]
TREATED AS CATCH [6]
OTHER / UNKNOWN [7]

DESCRIBE ANY INJURIES RESULTING FROM INCIDENTAL CAPTURE OR "OTHER" CONDITION:

☐ YES NO [1] [2] _____

☐ PHOTOS TAKEN? ☐ SAMPLES COLLECTED? YES [1] NO [2] (describe on back)

NOTES: Use back of form for notes on any abnormalities, diseases, epibiota, signs of shark attack, and the diagnostic characteristics observed when identifying specimens not brought aboard.

Figure 7-10: Sea Turtle Life History Form – Front

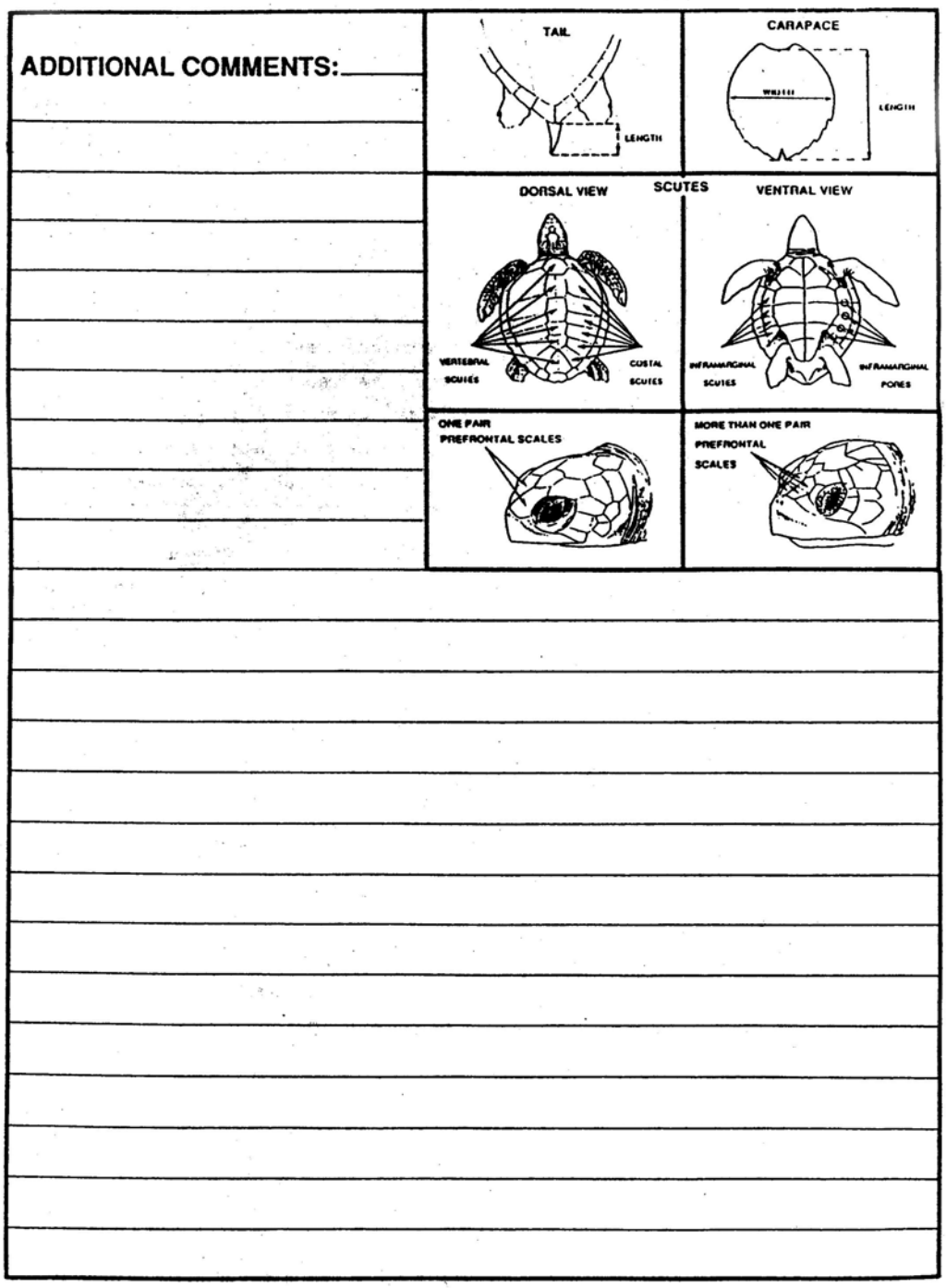


Figure 7-10: Sea Turtle Life History Form-Back

Chapter 8

Health and Safety Information

Focus Questions:

- When do Observers fill out a vessel safety checklist?
- A Commercial Vessel Safety Examination Decal is good for how many years from the date of issue?
- How should Observers respond to an emergency on board?
- What are the procedures to follow in an abandon ship situation?
- What are the seven steps to survival?

Chapter Outline:

I. Introduction

II. Safety Regulations

III. Before Observers Board the Vessel

IV. Safety While Boarding or Disembarking Vessels

V. Emergencies on Board

VI. Federal Requirements for Commercial Fishing Industry Vessels

I. Introduction

Commercial fishing is a dangerous occupation. Slippery decks, heavy gear, and an inhospitable environment are inherent dangers on fishing vessels. The safety and survival material presented here and in Observer training is only an introduction to these topics. There are many pamphlets, books, and videos that provide more detailed information about sea safety and survival including the North Pacific Fishing Vessel Owners Association's *Vessel Safety Manual*, and the University of Alaska's Marine Advisory Bulletin "Beating the Odds on the North Pacific", which will be given to you. Most fishing vessels are operated by safety-minded skippers who realize the danger of their occupation and consider safety in all that they do. Use the knowledge and experience of the vessel's crew for guidance on safety on board the vessel. They are certainly concerned about the safety of an Observer, a guest on their vessel, and will make sure that dangers for Observers are minimized. No matter how cautious the crew is it is **the Observers' responsibility** to keep themselves safe and know how to react in all emergency situations.

II. Safety Regulations

The Commercial Fishing Vessel Safety Act of 1988 mandates certain safety equipment, instructions, and drills aboard vessels that operate beyond the boundary line (a federally designated line between points of land) or carry more than 16 individuals. Most vessels that need Observers fall under these regulations  In mid 1998, NOAA Fisheries adopted regulations to ensure the adequacy and safety of fishing vessels carrying Observers. Under 50 CFR Part 600, owners and operators of fishing vessels that carry Observers are required to comply with U. S. Coast Guard safety regulations (see Appendix P). A vessel is considered inadequate or unsafe if it does not comply with the regulations regarding Observer accommodations or if it has

not passed a USCG safety examination or inspection. If Observers feel uncomfortable boarding a vessel because it is unsafe or inadequate for you to carry out your required duties, contact a NOAA Fisheries coordinator immediately. A vessel that would normally carry an Observer, but is deemed unsafe, is prohibited from fishing without an Observer or a waiver.

When boarding a vessel, regulations mandate that Observers receive a safety orientation. This may be as simple as a crew member showing the Observer around, but may include watching videos, donning immersion suits, or conducting drills.

III. Before Observers Board the Vessel

WCGOP Observers are required to check every vessel they board for safety equipment required by U.S. Coast Guard regulations. Prior to leaving on the first trip on any vessel, all Observers must do the following two things:

- Complete a Vessel Safety Orientation Checklist (See Figure 8-1).
- Mail or fax a copy of the completed Vessel Safety Orientation Checklist to the assigned coordinator.

After the initial trip, periodically verify that the vessel safety gear remains on the vessel and is in working order. If at any point the vessel does not meet U.S. Coast Guard safety regulations, the vessel is considered unsafe to carry an Observer and you may not board. If this should occur, contact a coordinator immediately.

Vessel Safety Orientation Checklist

The Vessel Safety Orientation Checklist is designed to facilitate the initial safety check. Always verify all the items on the checklist before embarking on a vessel for the first time. Write thorough comments on any items that are unavailable, unsafe or look inadequate. Always advise a coordinator immediately of any unsafe situation and NEVER leave on a vessel that you do not feel is safe.

Checklist of Vessel Safety Equipment

1. Check for safety inspection documentation. Look for a current USCG Commercial Fishing Vessel Safety Examination decal. These decals are valid for two years from the month issued, indicated with the hole punch (See Figure 8-2).

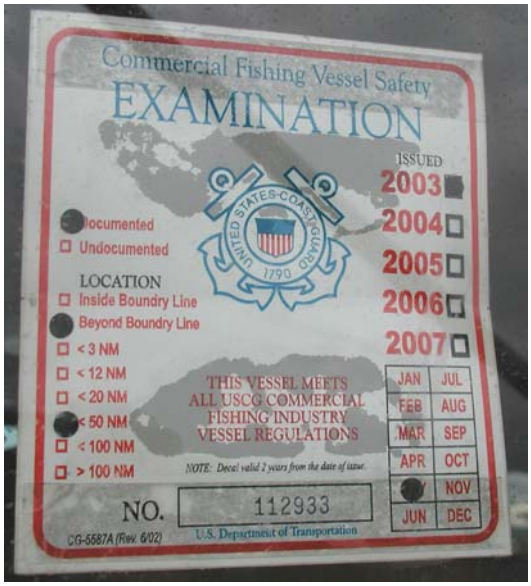


Figure 8-2: USCG Commercial Fishing Vessel Safety Examination Decal

2. Find the station billet (commonly called the station "bill"), a posted placard describing the role of all hands on board (including the Observer) in an emergency.

3. Locate life rafts - Are you assigned to a particular one? Is there enough life raft capacity for everyone on board including you? Check and record the service dates displayed on the canister and hydrostatic release.

4. Life raft equipment – Is the life raft equipped with a SOLAS pack? Ask the captain.

5. Immersion suits/life preservers - where are the survival suits and PFDs located? Are there enough for everyone on board? Are they accessible at all times? Observers will be issued an immersion suit and PFD with their sampling gear. Observers should always keep the immersion suit in a place where it can be accessed easily and quickly. The cabin is recommended, but may have limited space.

6. Life rings - Where are they? Are they accessible?

7. Flares – Where are the flares located? Check and record the expiration date. Does this vessel also have approved smoke signals?

8. EPIRBS – Where is the Emergency Position Indicating Radio Beacon (EPIRB)? Is there more than one? Read the instructions. Check and record battery, hydrostatic release, and NOAA registration expiration dates.

9. Fire extinguishers – Where are they? Are they accessible? Are they up to date, charged, and ready to use?

10. First aid materials – Where are first aid materials kept? Is there a reference book on board?

11. Radios – Where are the radios? Are emergency call instructions posted nearby? Do you know how to operate the radio for an emergency call?

12. Are there emergency instructions for the vessel? Did the skipper ensure that you were given a safety orientation explaining the following?

    - Survival craft embarkation stations
    - Survival craft assignments
    - Fire/emergency/abandon ship signals
    - Immersion (survival suit locations and donning instructions)
    - Procedures for making a distress call
    - Essential actions required of each person in an emergency
    - Procedures for recovering a person overboard
    - Procedures for fighting a fire

13. Injury placard – Is there an injury placard? Where is it?

14. Compass – Does the vessel have a compass?

15. Anchor – Does the vessel have an anchor?

16. General alarm – Does the vessel have a general alarm? Ask the captain to test the general alarm so that you can hear what it sounds like.

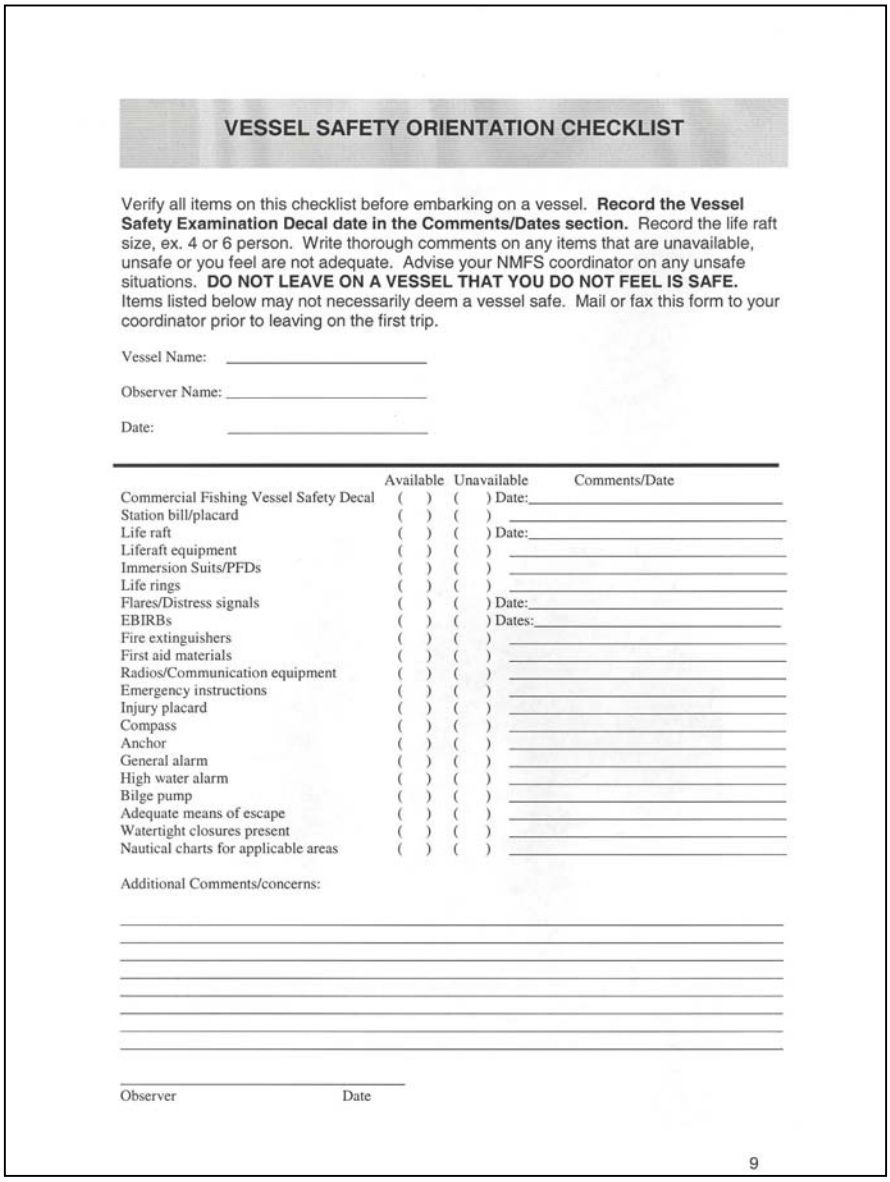
17. High water alarm – Does the vessel have a high water alarm?

18. Bilge pump – Does the vessel have a bilge pump?

19. Adequate means of escape – Does the vessel have adequate means of escape from the quarters? Are any hatches or passageways blocked or difficult to get to? Memorize the exit route from the cabin, the galley, and other locations where a fair amount of time is spent.

20. Water/weather tight closures present both on the interior and outside? Can they be secured in case of heavy weather or emergencies?

21. Nautical charts for applicable areas – Does the vessel have the applicable charts?



VESSEL SAFETY ORIENTATION CHECKLIST

Verify all items on this checklist before embarking on a vessel. **Record the Vessel Safety Examination Decal date in the Comments/Dates section.** Record the life raft size, ex. 4 or 6 person. Write thorough comments on any items that are unavailable, unsafe or you feel are not adequate. Advise your NMFS coordinator on any unsafe situations. **DO NOT LEAVE ON A VESSEL THAT YOU DO NOT FEEL IS SAFE.** Items listed below may not necessarily deem a vessel safe. Mail or fax this form to your coordinator prior to leaving on the first trip.

Vessel Name: _____

Observer Name: _____

Date: _____

	Available	Unavailable	Comments/Date
Commercial Fishing Vessel Safety Decal	( )	( )	Date:
Station bill/placard	( )	( )	
Life raft	( )	( )	Date:
Liferaft equipment	( )	( )	
Immersion Suits/PFDs	( )	( )	
Life rings	( )	( )	
Flares/Distress signals	( )	( )	Date:
EBIRBs	( )	( )	Dates:
Fire extinguishers	( )	( )	
First aid materials	( )	( )	
Radios/Communication equipment	( )	( )	
Emergency instructions	( )	( )	
Injury placard	( )	( )	
Compass	( )	( )	
Anchor	( )	( )	
General alarm	( )	( )	
High water alarm	( )	( )	
Bilge pump	( )	( )	
Adequate means of escape	( )	( )	
Watertight closures present	( )	( )	
Nautical charts for applicable areas	( )	( )	

Additional Comments/concerns:

_____

Observer Date

9

Figure 8-1: Vessel Safety Orientation Checklist

IV. Safety While Boarding or Disembarking Vessels

Wear a life jacket at all times on skiffs or other small vessels. When climbing, you should not be encumbered with heavy backpacks or baggage. Balance is important and both hands must be free while boarding or leaving a vessel. Use a daypack and wear comfortable footwear such as Xtra-Tuffs or athletic shoes that give sure footing. Time your actions with the movement of the boat; i.e. start the climb up a ladder from the top of the up-and-down cycle to avoid being pinched against the ladder by a moving boat. All baggage should be secured with lines and transferred via rope lines or cargo nets. Observer baskets and luggage have been lost overboard because they were thrown without lines attached.

Personal Health and Safety Aboard Vessels

Fishing vessels have many potentially dangerous areas. Be aware of the surroundings at all times and keep eyes and ears tuned to what is going on. The hours, the environment, the food, and the work may be quite different from what your body is accustomed to. Drinking plenty of water and eating enough food are two critically important factors in maintaining health in this new environment.

General Safety Precautions on Board

- Apparel with loose strings or tabs and jewelry such as rings should be avoided as these might become caught in the equipment or moving belts. Long hair should be tied back.

- Don't run aboard ships, particularly up stairwells. Always hold handrails in stairwells and on ladders. Slipping, tripping, and falling are the most common causes of injury.

- Lift correctly! When lifting, get as close as possible to the object, keep the back straight while using your legs. On a moving vessel, this is critical because unexpected movements can cause back strain. Don't be afraid to ask for assistance in moving large weights.

- Fatigue and sleep deprivation suffered by the crew and by the Observer are threats to everyone's safety. Be aware of the physical state of other people on the vessel—whether the person on watch or in control of the gear. Fatigued individuals make mistakes. Monotonous work, such as longline tally samples, is difficult to do accurately and safely when tired. Follow the example of the crew and "catch up" on sleep when there are breaks in fishing. Vegetarians (due to meat-and-potatoes menus) and diabetics (due to odd eating schedules) need to be especially concerned about getting a proper diet. Dietary supplements, vitamins, and extra medications should be considered.

- When you are not feeling well, use extra caution and reduce the time spent working.

Working on Decks

- Wear a life vest or other flotation and boots when on deck.

- Do not stay outside on the deck during rough seas. One Observer was swept forward over a trawler's winches by waves sweeping up the stern ramp. When outside, remain in full view of a second party at all times.

- Watch out for slick spots where the deck is wet and oily or frozen, step carefully over the half-foot combing rising from the bottom of metal

latch doors and passageways, and look out for low overheads in vessel stairwells and watertight doors.

- Beware of trawl cables under strain, they have given way and have maimed and killed fishermen. Whenever a cable is subjected to tension, stand out of the way of backlash. If the Observer sampling station is on deck, stop working while a trawl is being set or retrieved and go to a safe place.

- Explain to the crew that codend and/or bin/trawl alley measurements will need to be done once the winches have stopped. Ask for advice on a safe place to stand. When nets are being hoisted off the deck, stand clear. Heavy nets have fallen near Observers when the suspending cables parted.

- Watch for moving pots and face the direction of the pot launcher while working. Stay away from the buoy line when the crew is launching pots. Crewmen have been caught in a loop, or the "bite," of the line and pulled overboard.

- Wear eye protection on longliners whenever near the moving hooks.

- Use a gaff to collect fish to protect your hands and keep your body further away from the line.

Seasickness

One of the least pleasant aspects of going to sea is the possibility of seasickness. An individual's susceptibility to seasickness is highly variable. Observers that have experienced motion sickness in cars, planes, or amusement park rides, may experience seasickness during the cruise. Most people feel some level of discomfort when they first go to sea. Seasickness is a result of a conflict in the inner ear (where the human balance mechanism resides) caused by the erratic motion of the ship through the water. Inside the cabin of a rocking boat, for example, the inner ear detects changes in linear and angular acceleration as the body bobs with the boat. But since the cabin moves with the passenger, the eyes register a relatively stable scene. Agitated by this perceptual incongruity, the brain responds with stress-related hormones that can lead to nausea and vomiting. Its effect can be magnified by strong smells (like diesel fumes or fish, which are part of daily life at sea). Seasickness usually occurs in the first 12-24 hours after sailing. For most people, seasickness dissipates when the body becomes acclimated to the ship's motion (getting one's "sea-legs"). In rare cases, an individual may stay ill beyond the first couple of days at sea, regardless of sea state. If this occurs, dehydration may become life threatening if it leads to shock. Take seasickness medication before going to sea. There are several over-the- counter or prescription medications available to minimize seasickness. Antihistamines such as Dramamine (generic name is dimenhydrinate) or Bonine (generic name is meclizine) are effective and are available over-the- counter. However, these drugs cause drowsiness. A two part, prescription-only drug called the "Coast Guard Cocktail", contains promethazine, a seasick-preventing antihistamine coupled with ephedrine, which prevents drowsiness. Transderm Scop is another prescription-only motion sickness drug. It is a dime-sized adhesive patch that is worn behind the ear and delivers a continuous dose of scopolamine. Each patch lasts for 72 hours. The main side effects of the patch are dry mouth and occasionally blurry vision, but there is less drowsiness.

Acupressure wristbands and eating crystallized ginger are other remedies used with varying success. Seasick medications must be taken before the symptoms begin. Most medications take several hours to be absorbed into the body. If you are vomiting and cannot keep anything in your stomach taking medication at sea will not be an option. Even if you doubt that you will get seasick, you might want to take the medication before you board as a precaution against rough weather. If you should get seasick, take comfort in the fact that recovery is only a matter of time. All that is usually required for a complete recovery is some patience. Here are a few tips and considerations regarding seasickness:

- Continue eating items like crackers, dry toast, dry cereal, etc. (avoid anything greasy, sweet, or hard to digest). Keeping something in your stomach suppresses nausea, or, when vomiting, eliminates painful "dry heaves".

- Keep drinking fluids. Seasickness and related medications cause dehydration and headaches. Try to drink juices low in acidity, clear soups, or water, and stay away from milk or coffee.

- Focus on the horizon to eliminate the visual conflict in your brain.

- The vessel's motion is generally less pronounced the further astern you go. Try to stay as far back from the bow as possible.

- Keep working. Most people find that being busy on deck keeps their minds off their temporary discomfort. Also, the fresh air out on deck is often enough to speed recovery.

- Carry a plastic bag. This simple trick allows some peace of mind and eliminates some of the panic of getting sick. When vomiting over the

side, be aware of which way the wind and waves are coming.

- Going to the leeward side will ensure that an unpleasant experience doesn't become any more unpleasant.

- Above all, don't be embarrassed or discouraged. When Observers are seasick, chances are that others people on board are seasick too! No one is immune to seasickness.

Fish and Mammal Poisoning

Bacteria from fish may lead to infection in cuts, scrapes, or punctures. To prevent "fish poisoning", wash your hands thoroughly after sampling in a solution of hot, soapy water. Change gloves often to keep them dry and discard any torn gloves. Treat ***all*** minor cuts, especially those on your hands, with antiseptic such as Betadine to avoid infection from fish slime.

Be cautious whenever wading through fish on deck. Fish spines, especially on rockfish, can penetrate rubber boots and cause painful wounds to the feet. Spines often carry bacteria and can lead to fish poisoning.

If a wound gets red or swollen, soak it for ½ hour in very hot, soapy water at least three times a day. Dry and bandage the wound. Antibiotics are commonly prescribed for fish poisoning. The vessel will probably have some on board should they be needed. Never leave an infection untreated--the threat to your health can become much more far-reaching than simply a pair of inoperative hands.

Take extra precautions against infection when collecting specimens from marine mammals. Because these mammals have similar biological systems to our own, organisms that infect them, can infect us. "Seal finger" is a fungal infection

of the hands that can easily be contracted by a scratch or bite.

Harassment

Providing a safe and hostility-free work environment is the responsibility of the contractor (as the employer) and the vessel's personnel (by regulation). It is of utmost importance to the Groundfish Observer Program. However, verbal, physical, or sexual harassment of Observers can occur at sea. While the crew of a fishing vessel may have established a working rapport among themselves, Observers who come on board for a single trip limit period are not part of that system and in fact, may be considered unwelcome government agents or even "fish cops." Observers, therefore, can be subject to negative attention, comment, or actions.

Harassment of Observers by vessel personnel is strictly prohibited in 50 CFR 679.7 9(g). "It is illegal to (1) Forcibly assault, resist, oppose, impede, intimidate, or interfere with an Observer."

Identifying Harassment

Harassment can take many forms such as:

- Repeatedly waking an Observer during sleep periods.
- Providing substandard accommodations and food.
- Criticizing an Observer's sampling techniques or reporting practices.

In all cases, harassment is defined as when the Observer feels threatened or feels that their work or living environment is being compromised. You may feel embarrassed, or worry that you did something to provoke the unwanted behavior, but

you have a right to perform your job in an environment free from this type of interference.

Sexual Harassment

Sexual harassment is unwelcome behavior of a sexual nature. Privacy is greatly reduced onboard a vessel, and interactions can become intense very quickly. Sexual harassment may include sexist remarks or behavior, or sexual advances which result in a tense and unproductive work environment. Examples of sexual harassment might include: suggestive sounds or gestures, sexual remarks about clothing, body or sexual orientation, leering or ogling, persistent sexual comments and jokes, or constant brushing against or touching a person's body. Sexual harassment is unwanted attention in a nonreciprocal relationship (relationships with vessel and plant personnel are prohibited under Observer standards of conduct). In most normal interpersonal relationships, an individual can exercise free choice in deciding to develop a relationship based on mutual caring and respect. These elements are absent in sexual harassment. Sexual assaults have occurred on fishing vessels at sea. If you feel harassed, report it before the problem escalates.

What to Do if Observers Experience Harassment

If you experience harassment in any form, confront it directly and document it completely. By reporting harassment, it protects future Observers as well as yourself. Please report any cases of harassment to the Observer Program or NOAA Fisheries Enforcement as soon as possible. The agency is unable to help with problems if they are unaware of them.

Follow these steps:

1. Say no. Tell the harasser that his/her comments, actions or advances are unwanted and that they should stop. Remember that you are the judge of whether another person's actions negatively affect you.

2. Don't fight fire with fire. Observers should behave professionally at all times. Make sure that verbal and non-verbal body language exhibit a clear message to the harasser to stop.

3. Document all harassment incidents from the very beginning. Even if you are unsure at first if you are experiencing harassment, record the details. They may provide you with the full story if the situation escalates. In the logbook, describe the situation, including who, what, where and when. Detail the attempts made to end the harassment and the response that was received.

4. If the problem continues, report it to the skipper. Tell the skipper the full story, explain that it is affecting your work, and request that he take steps to end the problem. Most skippers do not want trouble on the boat. If the skipper is informed that trouble is brewing, he should take appropriate action. Document any further incidents and the skipper's actions.

5. If the harassment is not taken care of by the skipper, or if there is a problem with the skipper, report the offense to a coordinator and your contractor at the first opportunity. If there is no resolution, the coordinator will make arrangements for you to leave the vessel.

Illness and Accidents

Observers must contact a coordinator and AOI any time an injury occurs or any time illness or injury prevents sampling!

If you become ill on board, such as coming down with a severe cold or flu or seasickness that inhibits work, you must inform your coordinator of the situation. If the illness gets worse or continues to affect your work for more than three days, your assignment may need to be changed. If you are hurt on board, contact AOI and your coordinator. If the accident is serious, the captain will contact the USCG who will respond as necessary.

V. Emergencies on Board

Cold-Water Near Drowning

Cold-water near drowning is a phenomena that has been observed in cold waters. Victims have been revived using CPR after being immersed in cold water for up to one hour. CPR is an exhaustive activity that requires more than one caregiver. The compression rate should be about 80 beats per minute in series of fifteen compressions, followed by two breaths. It has been said that bad CPR is better than no CPR. Keep in mind that although a victim looks dead, s/he may be revived by this technique

Man Overboard

Everyone has an active role in a man overboard emergency. If you witness someone falling over, you must notify the person at the vessel controls and keep the victim in sight. According to the station bill, crew members are assigned specific tasks; for example, donning an immersion suit to be the rescue swimmer, launching a life boat, or throwing a life ring. As an extra set of eyes, the best role for the Observer is

to keep eyes on the victim and an arm pointing to the victim. This helps the person at the controls.

Fire

A fire needs heat, fuel and oxygen. Remove any one of these components to stop a fire. Ships carry large quantities of fuel and offer few places to go in the event of fire. Station bills give specific duties responding to a fire on board including who is in charge of the fire fighting team, and what equipment each person is responsible to gather. It is wise to know where fire extinguishers and exits are located in every area of the vessel—especially those areas in which you spend time. Fire extinguishers have only short bursts of fire retardants, so back-up extinguishers should be located and brought to the fire as soon as the fire is discovered. To effectively use a fire extinguisher, fire in short bursts in a low, sweeping motion. Keep your body low to avoid smoke inhalation and heat. Do not attempt to fight any fire alone, (except a small fire e.g. a wastebasket fire)— sound the alarm immediately before action is taken. After a fire, thorough inspection must be made of the area—including adjacent walls and rooms, to be sure the fire did not spread and will not flare up again.

Flooding

When a vessel is taking on water, usually the crew has time to try and solve the problem. Malfunctioning pumps or leaks in through-hull fittings are not uncommon, and can usually be fixed with equipment on board. If the flooding condition worsens, the Coast Guard can drop pumps to a vessel via aircraft. Observers have limited roles in these types of vessel emergencies but should be prepared to assist if needed.

Sending a May Day

A mayday call is for a life-threatening emergency. The emergency frequencies are Channel 16 on VHF radios and 2182.0 kHz or 4125.0 kHz on single side band radios (SSB). VHF radios are for short range and SSB radios are for long-range communications (See Appendix R for more information on radios). Vessels are required to monitor the emergency frequencies at all times. Most radios have a red button that changes to the emergency frequency immediately. Near the radios, there should be a placard posted that describes MAYDAY calls. Be familiar with what constitutes a proper MAYDAY call:

- MAYDAY MAYDAY MAYDAY (said three times)
- Vessel name (said three times)
- Location
- Nature of emergency
- How many persons on board
- Vessel description
- What radio frequency is being used

Abandon Ship

The worst possible emergency requires a person to give up their shelter—the vessel. Never abandon the ship unless it is certain that being on board the vessel is more dangerous than being in the water. Lives have been lost because ships have been abandoned too soon during fires or flooding. Knowing the nearest exits, mustering areas, life raft locations, immersion suit locations, EPIRB locations, and the emergency equipment available become critical factors in helping you survive an abandon ship emergency.

General Abandon Ship Procedures are as follows:

1. Prepare to abandon ship by doing as many of the following things as time and circumstances permit:

    - Sound General Alarm.
    - Send Mayday.
    - Don immersion suits/PFDs. Put on extra warm clothing first if possible.
    - Prepare to launch life raft. Attach sea painter to vessel.
    - Assemble signal devices to take into life raft. These include EPIRBs, flares, smoke signals, flashlights, handheld radios, etc.
    - Get first aid kit to take into life raft.
    - Get extra food and water to take into life raft.

2. Muster at embarkation station.
3. When sinking is imminent or remaining on board is inappropriate:

    - Launch and board life raft.
    - Keep sea painter attached to vessel. Be prepared to cut sea painter immediately if there is risk to life raft or vessel sinks

4. Activate EPIRB and commence 7 Steps to Survival.

CHAPTER 8

Donning the Immersion Suit

An immersion suit is a shelter that is required by the safety regulations for everyone aboard a vessel that operates in cold water. The assigned vessel will have enough aboard for the crew. You will be issued an immersion suit with your gear. You should always know where the immersion suits are stored. You should be able to put on an immersion suit in less than a minute, even in the dark!

The procedure for donning an immersion suit is as follows:

1. Sit on deck and work your legs into the suit. It may be necessary to remove your boots. Placing plastic bags over the boots or feet may help your legs slide easier.

2. Place your weak arm in first, and then pull the hood over your head (or hood first, then weak arm). If you have long hair, make sure that it is safely tucked in the hood.

3. Holding the zipper below the slide with one hand, lean back to straighten the zipper and pull the lanyard with the other hand. Secure the face flap. Do not inflate the air bladder until in the water.

4. Jumping in the water is the last resort. Ease yourself into the water if possible. If jumping, protect your head and keep your feet together to protect from floating debris.

Life Rafts

The assigned vessel will have enough life rafts or life boat capacity for everyone on board. Life rafts are stored in canisters that allow them to float free and automatically inflate if the vessel sinks. It is much better to manually launch and inflate the raft if there is time. Know where the rafts are stored, how to remove them from the cradle, where to launch them, and how to inflate them.

Survival Kits

A personal survival kit can take up very little space in an immersion suit yet greatly enhance the ability to survive. Think of the seven steps to survival and choose items that may help in an emergency situation on board a vessel. Items such as a knife, dental floss (a strong multi-purpose line), plastic garbage bags, matches, signal mirrors, a compass, hard candy, or bouillon cubes are small items that fit in a zip-lock bag and could save your life. Vessels may have an emergency bag stored and a person named in the station bill to bring it.

EPIRBS

The vessel will have at least one 406 mHz EPIRB mounted in a float-free bracket that will be automatically activated in the event of sinking. The signal is received by satellite, and in new styles, will identify the sender. It is important to know where the EPIRB is mounted and how to activate it manually. In the event of an abandon ship emergency it is an item you want to take with you. Someone will be assigned that duty on the station bill. Be sure to locate the EPIRB(s) on the vessel and read the directions on how to activate them.

The Seven Steps to Survival

The USCG assembled the Seven Steps to Survival from personal experiences of those who survived emergency situations. Committing the seven steps to survival to memory should be one of the goals of every Observer learning how to survive at sea. Every time the situation changes—boarding a raft, reaching land, etc., the seven steps begin again.

1. **Recognition** - You must quickly recognize the seriousness of the situation and that your life is in danger. Hesitation or denial may cost your life.

2. **Inventory** - Stop and assess the situation. Decide what you have that will help you survive and what are the hindrances. Inventory equipment, weather, your skills, injuries, and your mental condition. Doing so will help you to make good decisions that will help you survive.

3. **Shelter** - Your biggest enemy is the cold. Shelter can be clothing, an immersion suit, a raft, or an overturned vessel—anything that protects you against the loss of your body heat. Water can take heat away from your body much quicker than air, so shelter also helps you keep as dry as possible. High heat loss areas, including the head and neck, need to be protected most. The added buoyancy of a PFD helps to keep your head and neck out of water, therefore conserving heat. In a shore survival situation, the seven steps to survival start over again and shelter is your first priority after you inventory the situation. It takes hours to construct adequate shelter on shore and you must do so as soon as possible.

4. **Signals** - Anything that attracts attention and conveys a message is a signal. Radios, EPIRBs, and flares are signals carried by vessels. Immersion suits have lights attached. You may have a signal mirror in your personal survival kit. If abandoning ship, anything that can be tossed overboard may help an aircraft spot your position. ***Anything that makes you bigger, brighter, or different from your surroundings is a signal***, so an attempt to gather items, which float, from a sinking ship should be made. In a shore survival situation, three of anything (fires, buoys, immersions suits on the beach) is an internationally recognized distress signal.

5. **Water** - It is recommended that humans drink two liters of water per day to stay healthy. You can live without water for only a few days, and will suffer dehydration from the onset of any abandon ship emergency. Life rafts have limited rations of water, so it is advised to gather as much as possible before abandoning ship, if time permits. Have a strategy for gathering extra water in an emergency. ***Never drink seawater or urine.***

6. **Food** - A person can go without food much longer than without water. Never eat food without water—your body requires water to digest food. Life rafts are supplied with limited food rations. In a shore survival situation, many types of edibles can be found near shore. Almost any animals or green plants in the inter-tidal zone are edible, but avoid mussels or clams—they may cause paralytic shellfish poisoning.

CHAPTER 8

7. **Play** - Studies have shown that mental attitude makes a positive difference in a survival situation. Play is anything that keeps you occupied and prevents your mind from dwelling on the difficulties you are facing. Play could be reading, telling jokes or stories, completing a task, improving your shelter—anything that keeps your mind active and focused.

Summary

You can learn a lot about sea safety and survival from vessel personnel, who probably have many years of sea experience among them. However, the ultimate responsibility is upon you to survive. It is easy to think "this will never happen to me" and "the skipper will know what to do," but those thoughts may cost you your life. Take the time to learn as much as you can, and consider what your actions will be in emergency situations. Visualize yourself and your actions in emergency scenarios in the factory, on deck, in your bunk, or anywhere you spend time. Having thought about an emergency will make your actions more automatic, and the time saved may save your life. Your life is worth far more than any data you could collect in the fishery.

VI. Federal Requirements for Commercial Fishing Industry Vessels greater than 60 ft.

General Requirements

Documentation & Official Number 46 CFR 67-69

- Vessel must be measured and documented, documentation must be on board.
- Hailing/home port, and official number must be displayed in 4 inch letters on both bows.
- Official number must be 3-inch letters and attached to integral interior structure member.

Operator License 46 U.S.C. 8304

- The master, mate, and engineers on the vessel of 200 gross tons or more must have appropriate USCG license and operate within the limitations of the licenses.

Commercial Fishing Vessel

Safety Inspection Requirements 50 CFR 679.50, 33 CPR Chapter I, 46 CFR Chapter I, 46 CFR 28.710, 46 CFR U.S.C. 3311

- Must have a valid Commercial Fishing Vessel Safety Decal issued within the past 2 years that certifies compliance with regulations found in 33 CFR Chapter I and 46 CFR Chapter I.
- Must have a valid certificate of compliance issued pursuant to 46 CFR 28.710.
- Must have a valid certificate of inspection pursuant to 46 U.S.C.3311.

Navigational Requirements

Compass 46 CFR 28.230

- Each vessel must be equipped with an operable magnetic steering compass with a compass deviation table at the operating station.

Electronic Position Fixing Devices 46 CFR 28.260

- Vessels 79 feet or more in length must be equipped with an electronic positioning fixing device such as SAT NAV, GPS, LORAN, OMEGA, or RDF that is capable of providing accurate fixes for the area of operation.

Navigation and Anchor

Lights

- Must be used from sunset to sunrise and when there is limited visibility.
- Navigation Information 46 CFR 28.225.
- Current corrected charts of the appropriate areas and scale for safe navigation.
- Current corrected copy (or applicable extract) of the U.S. Coast Pilot, USCG Light List, National Ocean Service Tide Tables and National Ocean Service Current Tables.

Anchor and Radar Reflectors 46 CFR 28.235

- Vessels operating with more than 16 individuals on board or vessels operating outside boundary water.
- Each vessel must be equipped with appropriate anchor(s) and chain(s), cable, or rope.
- Nonmetallic hull vessels must be equipped with a radar reflector unless it is a vessel rigged with gear that can provide a radar signature at six miles.

Radar and Depth Sounding Devices 46 CFR 28.400

- Vessels with 16 or more individuals, or vessels operating outside boundary water, that have had their keel laid or major conversion on or after September 15, 1991:

- Each vessel must be fitted with a general marine radar system for surface navigation with a radar screen mounted at the operating station.

- Each vessel must be fitted with a suitable echo depth-sounding device.

Communications Requirements

Communications Equipment 46 CFR 28.245,46 CFR 28.375,33 CFR 26.03,47 CFR 80

- Each vessel must be equipped with VHF radiotelephone communication equipment operating within 156-162 Mhz band.

- A radio transceiver installed on board before Sept. 15, 1991, operating on 4-20 Mhz band may continue to be used to meet the requirements for vessels operating more than 100 miles from the coastline in Alaskan waters.

- ·All communications equipment must be operable from the vessel's operating station and must comply with FCC requirements including a Ship Radio Station License.

- ·An emergency source of power, that is independent of the main power supply, outside of the main machinery space, and capable of providing power to communications equipment for at least 3 continuous hours.

Emergency Requirements

Personal Flotation Devices (PFD) 46 CFR 28.105, 46 CFR28.110, 46 CFR 28.135, 46 CFR 28.140

- CG approved immersion suit with 31 square inches of retro reflective tape on the front and back of each side.
- Must have CG approved PFD light.
- Must be marked with the name of the vessel, owner of device, or the individual to whom it is assigned.

Ring Buoy 46 CFR 28.115 & 46 CFR 28.135

- Vessels less than 65 feet must have 1 orange Ring Life Buoy at least 24 inch in size, with 60 feet of line, and marked with name of vessel.
- Vessels greater than 65 feet must have 3 orange Ring Life Buoys at least 24 inch size with 90 feet of line. Marked with the name of the vessel.

Safety Protection Device (SPD)

- Vessels less than 65 feet must have a whistle that is audible for 1/ 2 minute.
- Vessels over than 65 feet must have a whistle that is audible for 1 minute.

Survival Craft 46 CFR Tables 28.120 (a)

- Between shore & 12 miles off coastline - inflatable buoyant apparatus.
- Between 12-20 miles off coastline - inflatable life raft.
- Between 20-50 miles off coastline - inflatable life raft with SOLAS B pack.
- Beyond 50 miles off coastline - inflatable life raft with SOLAS A pack.

Stowage of Survival Craft 46 CFR 28.125

- Each inflatable life raft that is required to be equipped with a SOLAS A or B equipment pack automatically inflates if the vessel sinks.

- Each inflatable life raft must be kept readily accessible for launching or be stowed so they will float free if the vessel sinks.

- Each hydrostatic release unit in a float free arrangement must have a CG approved number starting with 160.062.

Launching of Survival Craft 46 CFR 28.310

Vessels with 16 or more individuals, or vessels operating outside boundary water, that have had their keel laid or major conversion on or after September 15, 1991:

- A gate or other opening must be provided in deck rails, lifelines, or bulwarks adjacent to the stowage location of each survival craft which weighs more than 110 pounds, to allow the survival craft to be manually launched.

Embark Stations 46 CFR 28.395

Vessels with 16 or more individuals, or vessels operating outside boundary water, that have had their keel laid or major conversion on or after September 15, 1991:

- Each vessel must have at least one designated survival craft embark station (more if necessary) that is readily accessible from each accommodation space and workspace.

- Each embark station must be arranged to allow the safe boarding of survival craft.

Means of Escape 46 CFR 28.390

Vessels with 16 or more individuals, or vessels operating outside boundary water, that have had their keel laid or major conversion on or after September 15, 1991:

- Each space used by an individual on a regular basis or which is generally accessible to an individual must have at least two widely separated means of escape. At least one of the means of escape must be independent of watertight doors. Means of escape include normal exits and emergency exits, passageways, stairways, ladders, deck scuttles and windows.

Visual Distress Signals 46 CFR 28.145

- Vessels operating more than 3 miles from shoreline are required to carry 3 parachute flares, 6 hand flares, and 3 smoke signals.

- Vessels operating within 3 miles of the coastline are required to carry night and day visual distress signals. Night signals can be one electric distress light or 3 CG approved flares. Day signals can be either one distress flag or 3 CG approved smoke signals.

EPIRB 46 CFR 28.150 & 46 CFR 25.26

- Vessels operating beyond coastal waters are required to have an FCC type accepted category 1, float-free, automatically activated, 406 Mhz EPIRB.

- Each EPIRB must be marked with vessel name and type II retro reflective material (46 CFR 28.135).

General Alarm 46 CFR 28.240

- A general alarm system suitable for notifying individuals on board is required with a contact

marker at the operating station. The general alarm must be capable of notifying individuals in any accommodation or workspace. Under certain circumstances (defined at CFR 28.240) a public address system that is audible in all workspaces meets may meet regulatory requirements.

- In noisy workspaces a flashing red light is required.

- The general alarm system must be tested prior to getting underway and at least once each week while underway.

Emergency Instructions 46 CFR 28.265

- As applicable, emergency instructions are required for: survival craft embarkation stations and personnel assignments; fire, emergency, and abandon ship signals; immersion suit location and donning information; procedures for making distress calls; list of each individual's emergency and specially established procedures. Specific details and posting requirements are found at 46 CFR 28.265

Instruction, Drills, and Safety Orientation 46 CFR 28.270, 46 CFR 28.275

- At least once a month the master must ensure that drills are conducted and instructions are given to each person on board.

- No individual may conduct the drills or provide the instructions required by this section unless that individual has been trained in the proper procedures for conducting the activity. An individual licensed for operation of inspected vessels of 100 gross tons or more needs to

comply with the requirements in 46 CFR 28.275.

- Drills and instructions are to include: abandoning the vessel, fire fighting, man overboard recovery, stabilizing vessel after unintentional flooding, launching survival craft, and recovery of life and rescue boats, donning immersion suits, PFD's, fireman's outfits and breathing apparatus, radio and visual distress calls and signals, activating the general alarm and reporting of inoperative alarms and fire detection systems.

- Viewing of videotapes followed by discussion led by a person familiar with the subjects can be used for instruction requirements but not as a substitution for drills.

- The master must ensure that all individuals who have not received the above instruction or participated in the drills receive a safety orientation before the vessel may be operated. This safety orientation must explain the emergency instructions required by 46 CFR 28.265 and cover the specially established procedures listed above.

High Water Alarms 46 CFR 28.250

- Alarms are to be both visual and audible and installed at the operating station.

- Alarms are to indicate high water in each of the following normally unmanned areas: a space with a through-hull fitting below the deepest load water line, a machinery space bilge, bilge well, shaft alley bilge, or other space subject to flooding from sea water piping within the space, a space with a non-watertight closure such as a

space with a non-water tight hatch on the main deck.

Bilge Systems 46 CFR 28.255

- All vessels must be equipped with a bilge pump capable of draining any watertight compartment, other than tanks and small buoyancy compartments, under all service conditions.

- If portable bilge is used to meet this requirement, a suitable suction hose and discharge hose must be provided that will reach the bilges of all watertight compartments it must serve and ensure overboard discharge. The portable pump must be capable of dewatering each space at a rate of at least 2 inches of water depth per minute.

Casualties and Injuries 46 CFR 28.080, 46 CFR 28.090

If any of the following incidence occur, the master or other vessel representative must as soon as possible, contact the nearest USCG Marine Safety Office and submit written report CG-2692 within five days:

- Groundings

- Loss of main propulsion or primary steering

- Loss of life

- Injury which requires professional medical treatment beyond first aid and render the victim unfit to perform vessel duties.

- Any damage over $25,000, any occurrence affecting the sea-worthiness of the vessel such as; fire, flooding, or the failure or damage to fixed fire extinguishing systems, lifesaving equipment.

- Auxiliary power generating equipment or bilge pumping systems

Injury Placard 46 CFR 28.165

- A placard at least 5"x 7" stating the requirements of reporting injuries to vessel operator or agent as defined by US law, 46 U.S.C. 10603 must be posted in prominent place.

First aid Equipment and Training, 46 CFR 28.210

- Each vessel must have on board a first aid manual and medicine chest of a suitable size in a readily accessible location.

- Vessel with more than 2 individuals must have at least 1 individual approved in first aid and at least 1 individual approved in CPR or 1 individual approved in both.

- Vessels with more than 16 individuals on board must have at least 2 individuals approved in first aid and at least 2 individuals approved in CPR. Individuals approved in both may be counted against both requirements.

- Vessels with more than 49 individuals on board must have at least 4 individuals approved in first aid and at least 4 individuals approved in CPR. Individuals approved in both may be counted against both requirements.

Fire Control Requirements Fire extinguishers 46 CFR 28.155 & 46 CFR 28.160 & 46 CFR 25.30

- Vessels over 65' are required to have approved USCG approved fire extinguishers in each of the following locations: Pilot house, service spaces, galleys, paint lockers, accessible baggage and storage rooms, workshops and similar spaces, engine room, auxiliary engine room, auxiliary spaces, and generator spaces. **NOTE:** Specifics on the type of extinguishers, number

per location, and legal description of spaces where extinguishers are required can be found at 46 CFR 28.155 & 46 CFR 28.160 & 46 CFR 25.30.

Fire Pumps, Fire Mains, Fire Hydrants, and Fire Hoses. 46 CFR 28.316

Vessels with 16 or more individuals or that are outside of boundary borders that have had their keel laid or major conversion on or after September 15, 1991:

- Vessels >36' must be equipped with a self-priming, power driven fire pump connected to a fixed piping system.

- Specific requirements regarding locations and specifications for fire mains, fire hydrants, and fire hoses can be found at 46 CFR 28.316.

Fireman's Outfits and Self-contained Breathing Apparatus CFR 28.205

- Vessels equipped with refrigeration units using ammonia must be equipped with at least 2 self-contained breathing apparatus with spare air bottles for each.

- If the vessel has more than 49 individuals on board, at least 2 firemen's outfits, stowed in widely separated locations, are required. A fireman's outfit consists of one pressure demand open circuit MSHA/NIOSH approved self-contained breathing apparatus with a 30 minute air supply and a full face piece, one lifeline with a belt or suitable harness, one flashlight, a rigid helmet, boots, gloves, protective clothing, one fire axe, and a spare air bottle.

Miscellaneous Requirements

Guards for Exposed Hazards 46 CFR 28.215

- Suitable hand covers, guards, or railings must be installed in way of machinery that can cause injury to personnel, such as gearing, chain or belt drives, and rotating shafting. This is not meant to restrict necessary access to the fishing equipment such as winches, drums, or gurdies.

- Internal combustion engine exhaust pipes within reach of personnel must be insulated or otherwise guarded to prevent burns.

Watertight and Weather tight Integrity 46 CFR 28.560

- Each opening in a deck or a bulkhead that is exposed to weather must be fitted with a weather tight or watertight closure devise.

Pollution Prevention 33 CFR 151, 33 CFR 155

- Vessels are required to post oil pollution and garbage placards, and to have a written solid waste management plan that describes procedures for collecting, processing, storing, and discharging garbage, and designated person in charge of carrying out the plan. Restrictions on dumping can be found at 33 CFR 151, 33 CFR 155

Sexual Abuse Act of 1986 46 CFR U.S.C. 10104

- It is the responsibility of the master to report to the USCG any complaints of sexual offenses including aggravated sexual abuse, sexual abuse, sexual abuse of a minor or ward, and sexual contact per 46 CFR U.S.C. 10104

Appendix A: Fish Species List and Codes

Code	Common Name	Scientific Name
609	Anchovy, Deepbody	*Anchoa compressa*
610	Anchovy, Northern	*Engraulis mordax*
605	Anchovy, Unid	*Engraulididae*
681	Argentine, Pacific	*Argentina sialis*
204	Atka Mackerel	*Pleurogrammus monopterygius*
682	Barracuda, California	*Sphyraena argentea*
770	Barracudina, Unid	*Paralepididae*
475	Bass, Barred Sand	*Paralabrax nebulifer*
476	Bass, Giant Sea	*Stereolepis gigas*
477	Bass, Kelp	*Paralabrax clathratus*
478	Bass, Spotted Sand	*Paralabrax maculatofasciatus*
479	Bass, Striped	*Morone saxatilis*
480	Bass, Unid	*Percichthyidae/Serranidae*
481	Bass, White Sea	*Atractoscion nobilis*
683	Blackchin, Unid	*Neoscopelidae*
684	Blackdragon, Unid	*Idiacanthidae*
685	Blacksmith	*Chromis punctipinnis*
856	Blob Sculpin	*Psychrolutes phrictus*
686	Bonito, Pacific	*Sarda chiliensis*
687	Bristlemouth, Unid	*Gonostomatidae*
688	Butterfish, Pacific	*Peprilus simillimus*
689	Cabezon	*Scorpaenichthys marmoratus*
604	Capelin	*Mallotus villosus*
202	Cod, Pacific	*Gadus macrocephalus*
209	Cod, Pacific Tom	*Microgadus proximus*
690	Combfish, Longspine	*Zaniolepis latipinnis*
691	Combfish, Shortspine	*Zaniolepis frenata*
692	Corbina, California	*Menticirrhus undulatus*
725	Croaker, Black	*Cheilotrema saturnum*
726	Croaker, Spotfin	*Roncador stearnsi*
727	Croaker, Unid	*Sciaenidae*
728	Croaker, White	*Genyonemus lineatus*
729	Croaker, Yellowfin	*Umbrina roncador*
264	Cusk-eel, Basketweave	*Ophidion scrippsae*
261	Cusk-eel, Spotted	*Chilara taylori*
262	Cusk-eel, Unid	*Ophidiidae*
679	Daggertooth	*Anotopterus pharao*
899	Decomposed Fish	*Decomposed fish*
693	Deepsea smelt, Unid	*Bathylagidae*
228	Dolly Varden	*Salvelinus malma*

Code	Common Name	Scientific Name
694	Dolphinfish	*Coryphaena hippurus*
252	Eelpout, Bearded	*Lyconema barbatum*
254	Eelpout, Bigfin	*Lycodes cortezianus*
255	Eelpout, Black	*Lycodes diapterus*
256	Eelpout, Blackbelly	*Lycodopsis pacifica*
257	Eelpout, Blackmouth	*Lycodapus fierasfer*
258	Eelpout, Flatcheek	*Embryx crotalina*
259	Eelpout, Midwater	*Melanostigma pammelas*
260	Eelpout, Pallid	*Lycodapus mandibularis*
868	Eelpout, Snakehead	*Embryx crotalinus*
263	Eelpout, Soft	*Bothrocara molle*
253	Eelpout, Twoline	*Bothrocara brunneum*
250	Eelpout, Unid	*Zoarcidae gnn.*
251	Eelpout, Wattled	*Lycodes palearis*
91	Egg case Unid	*Egg case unid*
601	Eulachon	*Thaleichthys pacificus*
855	Fangtooth	*Anoplogaster cornuta*
777	Fish, Other Id	*Fish other id*
100	Flatfish, Unid	*Pleuronectiformes*
214	Flatnose, Pacific	*Antimora microlepis*
141	Flounder, Arrowtooth	*Atheresthes stomias*
142	Flounder, Starry	*Platichthys stellatus*
858	Flying Fish Unid	*Exocoetidae*
435	Fringehead, Onespot	*Neoclinus uninotatus*
436	Fringehead, Sarcastic	*Neoclinus blanchardi*
667	Garbage/ Trash	*Cans, bottles, old line, etc.*
853	Garibaldi	*Hypsypops rubicundus*
392	Greenling, Kelp	*Hexagrammos decagrammus*
394	Greenling, Painted	*Oxylebius pictus*
393	Greenling, Rock	*Hexagrammos lagocephalus*
390	Greenling, Unid	*Hexagrammidae*
391	Greenling, Whitespotted	*Hexagrammos stelleri*
82	Grenadier, Giant	*Albatrossia pectoralis*
83	Grenadier, Pacific	*Coryphaenoides acrolepis*
84	Grenadier, Popeye	*Coryphaenoides cinereus*
80	Grenadier, Unid	*Macrouridae*
180	Guitarfish, Banded	*Zapteryx exasperata*
181	Guitarfish, Shovelnose	*Rhinobatos productus*
430	Gunnel, Unid	*Pholidae*
695	Hachetfish, Unid	*Sternoptychidae*
850	Hagfish, Black	*Eptatretus deani*
79	Hagfish, Pacific	*Eptatretus stouti*

Code	Common Name	Scientific Name
77	Hagfish, Unid	*Myxinidae*
206	Hake, Pacific	*Merluccius productus*
697	Halfmoon	*Medialuna californiensis*
124	Halibut, California	*Paralichthys californicus*
101	Halibut, Pacific	*Hippoglossus stenolepis*
611	Herring, Pacific	*Clupea pallasii*
612	Herring, Round	*Etrumeus teres*
698	Jack, Yellowtail	*Seriola dorsalis*
740	Kelpfish, Giant	*Heterostichus rostratus*
741	Kelpfish, Striped	*Gibbonsia metzi*
742	Kelpfish, Unid	*Clinidae*
608	King of the Salmon	*Trachipterus altivelis*
75	Lamprey, Pacific	*Lampetra tridentata*
785	Lancetfish, Longnose	*Alepisaurus ferox*
699	Lancetfish, Unid	*Alepisauridae*
700	Laternfish, Unid	*Myctophidae*
150	Lightfish, Unid	*Photichthyidae*
603	Lingcod	*Ophiodon elongatus*
151	Lizardfish, California	*Synodus lucioceps*
152	Loosejaw, Unid	*Malacosteidae*
153	Louvar	*Luvarus imperialis*
530	Lumpsucker, Pacific Spiny	*Eumicrotremus orbis*
525	Lumpsucker, Unid	*Cyclopteridae*
198	Mackerel, Bullet	*Auxis rochei*
197	Mackerel, Frigate	*Auxis thazard*
207	Mackerel, Jack	*Trachurus symmetricus*
199	Mackerel, Pacific	*Scomber japonicus*
196	Mackerel, Unid	*Scombridae*
774	Manefish	*Caristius macropus*
154	Medusafish	*Icichthys lockingtoni*
869	Midshipman (Toadfish), Unid	*Batrachoididae*
664	Midshipman, Plainfin	*Porichthys notatus*
665	Midshipman, Specklefin	*Porichthys myriaster*
810	Mola Mola (Sunfish)	*Mola mola*
155	Mora, Hundred fathom	*Physiculus rastrelliger*
666	Mud, Kelp, Rocks, Wood, etc	*Mud*
156	Mullet, Striped	*Mugil cephalus*
297	Opah	*Lampris gattatus (regious)*
157	Opaleye	*Girella nigricans*
295	Oreo, Oxeye	*Allocyttus folletti*
762	Paperbone, Unid	*Notosudidae*
185	Pipefish, Bay	*Syngnathus leptorynchus*

Code	Common Name	Scientific Name
186	Pipefish, Snubnose	*Cosmocampus arctus*
453	Poacher, Beardless spearnose	*Ganoideus vulsus*
454	Poacher, Bigeye starnose	*Asterotheca pentacantha*
455	Poacher, Blackedge	*Xeneretmus latifrons*
456	Poacher, Blackfin starnose	*Bathyagonus nigripinnis*
457	Poacher, Bluespotted	*Xeneretmus triacanthus*
458	Poacher, Northern spearnose	*Agonopsis vulsa*
459	Poacher, Pricklebreast	*Stellerina xyosterna*
460	Poacher, Pygmy	*Odontopyxis trispinosa*
461	Poacher, Rockhead	*Bothragonus swani*
462	Poacher, Smootheye	*Xeneretmus leiops*
463	Poacher, Southern Spearnose	*Agonopsis sterletus*
464	Poacher, Spinycheek Starnose	*Asterotheca infraspinata*
452	Poacher, Sturgeon	*Podothecus acipenserinus*
465	Poacher, Tubenose	*Pallasina barbata*
450	Poacher, Unid	*Agonidae*
466	Poacher, Warty	*Occella verrucosa*
201	Pollock, Walleye	*Theragra chalcogramma*
158	Pomfret, Pacific	*Brama japonica*
272	Prickleback, Monkeyface	*Cebidichthys violaceus*
750	Prickleback, Unid	*Stichaeidae*
273	Prickleback, Whitebarred	*Poroclinus rothrocki*
205	Prowfish	*Zaprora silenus*
159	Queenfish	*Seriphus politus*
280	Ragfish	*Icosteus aenigmaticus*
99	Ratfish, Spotted	*Hydrolagus colliei*
561	Ray, Bat	*Myliobatis californica*
562	Ray, Pacific Electric	*Torpedo californica*
563	Ray, Unid	*Myliobatoidea*
564	Ribbonfish, Unid	*Trachipteridae*
334	Rockfish, Aurora	*Sebastes aurora*
337	Rockfish, Bank	*Sebastes rufus*
306	Rockfish, Black	*Sebastes melanops*
355	Rockfish, Black and Yellow	*Sebastes chrysomelas*
319	Rockfish, Blackgill	*Sebastes melanostomus*
316	Rockfish, Blue	*Sebastes mystinus*
302	Rockfish, Bocaccio	*Sebastes paucispinus*
356	Rockfish, Bronzespotted	*Sebastes gilli*
332	Rockfish, Brown	*Sebastes auriculatus*
357	Rockfish, Calico	*Sebastes dalli*
314	Rockfish, Canary	*Sebastes pinniger*
358	Rockfish, Chameleon	*Sebastes phillipsi*

Code	Common Name	Scientific Name
325	Rockfish, Chilipepper	*Sebastes goodei*
359	Rockfish, China	*Sebastes nebulosus*
327	Rockfish, Copper	*Sebastes caurinus*
360	Rockfish, Cowcod	*Sebastes levis*
311	Rockfish, Darkblotched	*Sebastes crameri*
361	Rockfish, Dwarf-red	*Sebastes rufianus*
362	Rockfish, Flag	*Sebastes rubrivinctus*
363	Rockfish, Freckled	*Sebastes lentiginosus*
364	Rockfish, Gopher	*Sebastes carnatus*
365	Rockfish, Grass	*Sebastes rastrelliger*
366	Rockfish, Greenblotched	*Sebastes rosenblatti*
339	Rockfish, Greenspotted	*Sebastes chlorostictus*
313	Rockfish, Greenstriped	*Sebastes elongates*
367	Rockfish, Halfbanded	*Sebastes semicinctus*
323	Rockfish, Harlequin	*Sebastes variegatus*
368	Rockfish, Honeycomb	*Sebastes umbrosus*
369	Rockfish, Kelp	*Sebastes atrovirens*
370	Rockfish, Mexican	*Sebastes macdonaldi*
303	Rockfish, Northern	*Sebastes polyspinis*
371	Rockfish, Olive	*Sebastes serranoides*
301	Rockfish, Pacific Ocean Perch	*Sebastes alutus*
372	Rockfish, Pink	*Sebastes eos*
373	Rockfish, Pinkrose	*Sebastes simulator*
374	Rockfish, Puget Sound	*Sebastes emphaeus*
335	Rockfish, Pygmy	*Sebastes wilsoni*
343	Rockfish, Quillback	*Sebastes maliger*
308	Rockfish, Redbanded	*Sebastes babcocki*
324	Rockfish, Redstripe	*Sebastes proriger*
309	Rockfish, Rosethorn	*Sebastes helvomaculatus*
312	Rockfish, Rosy	*Sebastes rosaceus*
307	Rockfish, Rougheye	*Sebastes aleutianus*
375	Rockfish, Semaphore	*Sebastes melanosema*
304	Rockfish, Sharpchin	*Sebastes zacentrus*
318	Rockfish, Shortbelly	*Sebastes jordani*
326	Rockfish, Shortraker	*Sebastes borealis*
354	Rockfish, Shortraker/Rougheye	*Sebastes Shortraker/Rougheye*
310	Rockfish, Silvergray	*Sebastes brevispinus*
376	Rockfish, Speckled	*Sebastes ovalis*
315	Rockfish, Splitnose	*Sebastes diploproa*
377	Rockfish, Squarespot	*Sebastes hopkinsi*
378	Rockfish, Starry	*Sebastes constellatus*
328	Rockfish, Stripetail	*Sebastes saxicola*

Code	Common Name	Scientific Name
379	Rockfish, Swordspine	*Sebastes ensifer*
329	Rockfish, Tiger	*Sebastes nigrocinctus*
380	Rockfish, Treefish	*Sebastes serriceps*
300	Rockfish, Unid.	*Sebastes*
331	Rockfish, Vermilion	*Sebastes miniatus*
305	Rockfish, Widow	*Sebastes entomelas*
322	Rockfish, Yelloweye	*Sebastes ruberrimus*
320	Rockfish, Yellowmouth	*Sebastes reedi*
321	Rockfish, Yellowtail	*Sebastes flavidus*
241	Ronquil, Northern	*Ronquilis jordani*
242	Ronquil, Stripefin	*Rathbunella hypoplecta*
240	Ronquil, Unid	*Bathymasteridae*
200	Roundfish, Unid	*Roundfish unid.*
203	Sablefish	*Anoplopoma fimbria*
221	Salmon, Dog (Chum)	*Oncorhynchus keta*
222	Salmon, King (Chinook)	*Oncorhynchus tshawytscha*
225	Salmon, Pink (Humpback)	*Oncorhynchus gorbuscha*
224	Salmon, Red (Sockeye)	*Oncorhynchus nerka*
223	Salmon, Silver (Coho)	*Oncorhynchus kisutch*
220	Salmon, Unid	*Oncorhynchus*
125	Sanddab, Longfin	*Citharichthys xanthostigma*
137	Sanddab, Pacific	*Citharichthys sordidus*
126	Sanddab, Speckled	*Citharichthys stigmaeus*
136	Sanddab, Unid	*Citharichthys*
239	Sandfish, Pacific	*Trichodon trichodon*
670	Sandlance, Pacific	*Ammodytes hexapterus*
614	Sardine, Pacific	*Sardinops sagax*
607	Saury, Pacific	*Cololabis saira*
790	Scaleless Dragonfish, Unid	*Melanostomiidae*
791	Scaly Dragonfish, Unid	*Stomiidae*
423	Scorpionfish, California	*Scorpaena guttata*
408	Sculpin, Brown Irish Lord	*Hemilepidotus spinosus*
409	Sculpin, Buffalo	*Enophrys bison*
410	Sculpin, Bull	*Enophrys taurina*
411	Sculpin, Fringed	*Icelinus fimbriatus*
412	Sculpin, Grunt	*Rhamphocottus richardsoni*
867	Sculpin, Lavender	*Leiocottus hirundo*
413	Sculpin, Pacific Staghorn	*Leptocottus armatus*
407	Sculpin, Red Irish Lord	*Hemilepidotus hemilepidotus*
414	Sculpin, Roughback	*Chitonotus pugetensis*
415	Sculpin, Sharpnose	*Clinocottus acuticeps*
416	Sculpin, Silverspotted	*Blepsias cirrhosus*

Code	Common Name	Scientific Name
417	Sculpin, Slim	*Radulinus asprellus*
418	Sculpin, Spinyhead	*Dasycottus setiger*
419	Sculpin, Spotfin	*Icelinus tenuis*
420	Sculpin, Thornback	*Paricelinus hopliticus*
421	Sculpin, Threadfin	*Icelinus filamentosus*
400	Sculpin, Unid	*Cottidae*
422	Sculpin, Yellowchin	*Icelinus quadriseriatus*
792	Searobin, Lumptail	*Prionotus stephanophrys*
793	Senorita, Senorita	*Oxyjulis californica*
606	Shad, American	*Alosa sapidissima*
575	Shark, Bigeye Thresher	*Alopias superciliosus*
69	Shark, Blue	*Prionace glauca*
68	Shark, Brown Cat	*Apristurus brunneus*
576	Shark, Brown Smoothhound	*Mustelus henlei*
870	Shark, Cat Unid	*Scyliorhinidae*
577	Shark, Common Thresher	*Alopias vulpinus*
578	Shark, Dogfish Unid	*Squalus sp.*
579	Shark, Filetail Cat	*Parmaturus xaniurus*
580	Shark, Gray Smoothhound	*Mustelus californicus*
581	Shark, Horn	*Heterodontus francisci*
582	Shark, Leopard	*Triakis semifasciata*
852	Shark, Longnose Cat	*Apristurus kampae*
583	Shark, Pacific Angel	*Squatina californica*
584	Shark, Pacific Dogfish	*Squalus suckleyi*
62	Shark, Pacific Sleeper	*Somniosus pacificus*
585	Shark, Pelagic Thresher	*Alopias pelagicus*
586	Shark, Prickly	*Echinorhinus cookei*
78	Shark, Sixgill	*Hexanchus griseus*
64	Shark, Soupfin	*Galeorhinus galeus*
66	Shark, Spiny Dogfish	*Squalus acanthias*
587	Shark, Swell	*Cephaloscyllium ventriosum*
65	Shark, Unid	*Squaliformes*
794	Sheephead, California	*Semicossyphus pulcher*
550	Skate, Big	*Raja binoculata*
551	Skate, Black	*Bathyraja trachura*
552	Skate, California	*Raja inornata*
553	Skate, Deepsea	*Bathyraja abyssicola*
554	Skate, Longnose	*Raja rhina*
555	Skate, Sandpaper	*Bathyraja interupta*
556	Skate, Starry	*Raja stellulata*
557	Skate, Thornback	*Platyrhiniodis triseriata*
90	Skate, Unid	*Rajidae*

Code	Common Name	Scientific Name
558	Skate, White	*Bathyraja spinosissima*
860	Slender Codling	*Halargyreus johnsonii*
160	Slickhead, California	*Alepocephalus tenebrosus*
161	Slickhead, Threadfin	*Talismania bifurcata*
162	Slickhead, Unid.	*Alepocephalidae*
175	Smelt, Jack	*Atherinops californiensis*
176	Smelt, Night	*Spirinchus starksi*
177	Smelt, Surf	*Hypomesus pretiosus*
178	Smelt, Top	*Atherinops affinis*
602	Smelt, Unid	*Osmeridae*
613	Smelt, Whitebait	*Allosmesus elongatus*
857	Smooth Stargazer	*Kathetostoma averruncus*
795	Snaggletooth, Unid	*Astronesthidae*
501	Snailfish, Blacktail	*Careproctus melanurus*
859	Snailfish, Pink	*Paraliparis rosaceus*
502	Snailfish, Prickly	*Paraliparis deani*
503	Snailfish, Ribbon	*Liparis cyclopus*
504	Snailfish, Ringtail	*Liparis rutteri*
505	Snailfish, Showy	*Liparis pulchellus*
506	Snailfish, Slipskin	*Liparis fucensis*
507	Snailfish, Spotted	*Liparis callyodon*
500	Snailfish, Unid	*Liparis*
119	Sole, Bigmouth	*Hippoglossina stomata*
109	Sole, Butter	*Pleuronectes isolepis*
118	Sole, C-O (C-O Turbot)	*Pleuronichthys coenosus*
110	Sole, Deepsea	*Embassichthys bathybius*
107	Sole, Dover	*Microstomus pacificus*
108	Sole, English	*Pleuronectes vetulus*
120	Sole, Fantail	*Xystreurys liolepis*
103	Sole, Flathead	*Hippoglossoides elassodon*
116	Sole, Hybrid	*Inopsetta ischyra*
112	Sole, Petrale	*Eopsetta jordani*
105	Sole, Rex	*Errex zachirus*
104	Sole, Rock	*Pleuronectes bilineatus*
114	Sole, Roughscale	*Clidoderma asperrimum*
115	Sole, Sand	*Psettichthys melanostictus*
111	Sole, Slender	*Eopsetta exilis*
796	Spookfish, Unid	*Opisthoproctidae*
270	Squaretail, Smalleye	*Tetragonurus cuvieri*
226	Steelhead (Rainbow Trout)	*Oncorhynchus mykiss*
559	Stingray, Diamond	*Dasyatis dipterura*
862	Stingray, Pelagic	*Dasyatis violacea*

Code	Common Name	Scientific Name
560	Stingray, Round	*Urolophus halleri*
231	Sturgeon, Green	*Acipenser medirostris*
230	Sturgeon, Unid	*Acipenser*
232	Sturgeon, White	*Acipenser transmontanus*
630	Surfperch, Black	*Embiotoca jacksoni*
631	Surfperch, Calico	*Amphistichus koelzi*
632	Surfperch, Kelp	*Brachyistius frenatus*
633	Surfperch, Pile	*Rhacochilus vacca*
634	Surfperch, Pink	*Zalembius rosaceus*
635	Surfperch, Rainbow	*Hypsurus caryi*
636	Surfperch, Redtail	*Amphistichus rhodoterus*
637	Surfperch, Rubberlip	*Rhacochilus toxotes*
638	Surfperch, Shiner	*Cymatogaster aggregata*
639	Surfperch, Silver	*Hyperprosopon ellipticum*
640	Surfperch, Spotfin	*Hyperprosopon anale*
641	Surfperch, Striped	*Embiotoca lateralis*
642	Surfperch, Unid	*Embiotocidae*
643	Surfperch, Walleye	*Hyperprosopon argenteum*
644	Surfperch, White	*Phanerodon furcatus*
861	Thornback	*Platyrhinoidis triseriata*
352	Thornyhead, Longspine	*Sebastolobus altivelis*
350	Thornyhead, Shortspine	*Sebastolobus alascanus*
349	Thornyhead, Shortspine/ Longspine	*Sebastolobus*
113	Tonguefish, California	*Symphurus atricauda*
854	Triggerfish, Finescale	*Balistes polylepis*
227	Trout, Cutthroat	*Oncorhynchus clarkii*
807	Tubeshoulder, Unid	*Searsiidae*
710	Tuna, Albacore	*Thunnus alalunga*
711	Tuna, Bigeye	*Thunnus obesus*
712	Tuna, Bluefin	*Thunnus thynnus*
713	Tuna, Skipjack	*Euthynnus lineatus*
714	Tuna, Yellowfin	*Thunnus albacares*
117	Turbot, Curlfin	*Pleuronichthys decurrens*
121	Turbot, Diamond	*Hypsopsetta guttulata*
102	Turbot, Greenland	*Reinhardtius hippoglossoides*
122	Turbot, Hornyhead	*Pleuronichthys verticalis*
123	Turbot, Spotted	*Pleuronichthys ritteri*
797	Viperfish, Pacific	*Chauliodus macouni*
805	Viperfish, Unid	*Chauliodontidae*
798	Whitefish, Ocean	*Caulolatilus princeps*
780	Wolf-eel	*Anarrhichthys ocellatus*
783	Wrymouth, Dwarf	*Cryptacanthodes aleutensis*

Code	Common Name	Scientific Name
760	Wrymouth, Giant	*Cryptacanthodes giganteus*
799	Wrymouth, Unid	*Cryptacanthodidae*

Appendix B: Invertebrate Species List and Codes

Code	Common Name	Scientific Name
1206	Amiphpod, Unid	*Amphipoda*
55	Anemone, Unid	*Actiniaria*
1207	Aplacophora, Unid	*Aplachophora*
48	Barnacles, Unid	*Cirripedia*
27	Bivalves, Unid	*Bivalvia*
866	Brachiopod, Unid	*Brachiopoda*
22	Brittle/Basket Star, Unid	*Ophiuroidea*
28	Chiton, Unid	*Neoloricata*
1201	Coral, Black	*Antipatharia*
1202	Coral, Gorgonian	*Gorgonacea*
1203	Coral, Soft	*Alcyonacea*
1204	Coral, Stony	*Scleractinia*
32	Corals, Unid	*Alyconaria*
19	Crab, Angulatus Tanner	*Chionoecetes angulatus*
888	Crab, Arched Swimming	*Callinectes arcuatus*
5	Crab, Armored Box	*Mursia gaudichaudi*
4	Crab, Bairdi Tanner	*Chionoecetes bairdi*
6	Crab, Brown Box	*Lopholithodes foraminatus*
7	Crab, California King	*Paralithodes californiensis*
10	Crab, Cancer Unid	*Cancridae*
39	Crab, Decorator Unid	*Majidae*
871	Crab, Deep-sea Rock	*Glyptolithodes cristatipes*
872	Crab, Deep-sea Spider	*Paralomis manningi*
12	Crab, Dungeness	*Cancer magister*
38	Crab, Flat-legged Spider	*Paralomis verrilli*
873	Crab, Furrowed Rock	*Cancer branneri*
44	Crab, Graceful	*Cancer gracilis*
874	Crab, Green	*Carcinus maenus*
17	Crab, Hair	*Paralomis multispina*
875	Crab, Heart	*Phyllolithodes papillosus*
15	Crab, Hermit Unid	*Paguridae*
876	Crab, Kelp Unid	*Pugettia ssp*
2	Crab, King Unid	*Lithode*
877	Crab, Long-armed Spider	*Macroregonia macrochiera*
840	Crab, Lyre Unid	*Hyas spp.*
878	Crab, Masking	*Loxorhynchus crispatus*
879	Crab, Pacific Rock	*Cancer antennarius*
880	Crab, Porcelain Unid	*Porcellanidae*
881	Crab, Puget Sound King	*Lopholithodes mandtii*

Code	Common Name	Scientific Name
882	Crab, Purple Globe	*Randallia ornata*
9	Crab, Red Rock	*Cancer productus*
883	Crab, Rhinoceros	*Rhinolithodes wosnessenskii*
16	Crab, Scarlet King	*Lithodes couesi*
884	Crab, Sheep	*Loxorhynchus grandis*
885	Crab, Spiky King	*Neolithodes diomedeae*
8	Crab, Spiny King	*Paralithodes rathbuni*
3	Crab, Tanner Unid	*Chionoecetes spp.*
18	Crab, Tanneri Tanner	*Chionoecetes tanneri*
886	Crab, Umbrella Unid	*Cryptolithodes ssp*
1	Crab, Unid	*Brachyura/Anomura*
887	Crab, Xantus Swimming	*Portunus xantusii*
11	Crab, Yellow Rock	*Cancer anthonyi*
53	Crinoids, Unid	*Crinoidea*
892	Crustacean, Unid	*Crustacea*
1205	Hydrocoral	*Hydrocorallinae*
13	Invertebrate, Unid	Animalia
33	Isopod, Unid	*Isopoda*
35	Jellyfish, Unid	*Scyphozoa*
34	Mollusk, Unid	*Mollusca*
25	Nudibranch, Unid	*Nudibranchia*
60	Octopus, Unid	*Octopoda*
1208	Peanut Worm, Unid	*Sipuncula*
41	Sea Cucumber, Unid	*Holothuroidea*
58	Sea Pen/Whip, Unid	*Pennatulacea*
30	Sea Snail, Unid	*Gastropoda*
889	Sea Spider, Unid	*Pycnogonida*
47	Sea Squirts, Unid	*Tunicata Tunicate*
20	Sea Star, Unid	*Asteroidea*
70	Shrimp, Unid	*Caridea*
891	Spiny Lobster, Unid	*Palinura*
26	Sponge, Unid	*Porifera*
890	Squat Lobster, Unid	*Galatheidae*
50	Squid, Unid.	*Teuthoidea*
49	Tunicate, Unid	*Urochordata*
54	Urchin, Unid	*Echinoidea*
1209	Worm, Unid	*Annelida*

Appendix C: Marine Mammal and Sea Turtle Species List and Codes

Code	Common Name	Scientific Name
1001	Beaked Whale, Bairds	*Berardius bairdii*
1002	Beaked Whale, Blainevilles	*Mesoplodon densirostris*
1003	Beaked Whale, Cuviers	*Ziphius cavirostris*
1004	Beaked Whale, Gingko-toothed	*Mesoplodon ginkgodens*
1005	Beaked Whale, Hectors	*Mesoplodon hectori*
1006	Beaked Whale, Hubbs	*Mesoplodon carlhubbsi*
1007	Beaked Whale, Stejnegers	*Mesoplodon stejnegeri*
1008	Beaked Whale, Unid	*Ziphiidae*
1009	Dolphin, Bottlenose	*Tursiops truncatus*
1044	Dolphin, Common Unid	*Delphinus*
1010	Dolphin, Long-beaked Common	*Delphinus capensis*
1011	Dolphin, Northern Right Whale	*Lissodelphis borealis*
1012	Dolphin, Pacific White-sided	*Lagenorhynchus obliquidens*
1013	Dolphin, Rissos	*Grampus griseus*
1014	Dolphin, Short-beaked Common	*Delphinus delphis*
1015	Dolphin, Striped	*Stenella coeruleoalba*
1016	Dolphin, Unid	*Delphinidae*
1017	Fur Seal, Guadalupe	*Arctocephalus townsendi*
1018	Fur Seal, Northern	*Callorhinus ursinus*
1019	Fur Seal, Unid	*Arctocephalinae*
1000	Marine mammal, Unid	*Marine mammal, Unid*
1020	Pinniped, Unid	*Caniformia*
1021	Porpoise, Dalls	*Phocoenoides dalli*
1022	Porpoise, Harbor	*Phocoena phocoena*
1023	Porpoise, Unid	*Phocoenidae*
1024	Sea Lion, California	*Zalophus californianus*
1025	Sea Lion, Stellar	*Eumetopias jubatus*
1026	Sea Lion, Unid	*Otariindae*
1027	Sea Otter	*Enhydra lutris*
1028	Seal, Harbor	*Phoca vitulina*
1029	Seal, Northern Elephant	*Mirounga angustirostris*
1030	Seal, Unid	*Phocidae*
1071	Turtle, Green/Black	*Chelonia mydas/agassizi*
1072	Turtle, Hawksbill	*Eretmochelys imbricata*
1073	Turtle, Leatherback	*Dermochelys coriacea*
1074	Turtle, Loggerhead	*Caretta caretta*
1075	Turtle, Olive Ridley	*Lepidochelys olivacea*
1070	Turtle, Unid	*Chelonidae*

Code	Common Name	Scientific Name
1031	Whale, Blue	*Balaenoptera musculus*
1032	Whale, Dwarf Sperm	*Kogia breviceps*
1033	Whale, Fin	*Balaenoptera physalus*
1034	Whale, Gray	*Eschrichtius robustus*
1035	Whale, Humpback	*Megaptera novaeangliae*
1036	Whale, Killer	*Orcinus orca*
1037	Whale, Minke	*Balaenoptera acutorostrata*
1038	Whale, Northern Right	*Eubalaena glacialis*
1039	Whale, Pygmy Sperm	*Kogia breviceps*
1040	Whale, Sei	*Balaenoptera borealis*
1041	Whale, Short-finned Pilot	*Globicephala macrorhynchus*
1042	Whale, Sperm	*Physeter catodon*
1043	Whale, Unid	*Whale unid.*

Appendix D: Seabirds Species List and Codes

Code	Common Name	Scientific Name
952	Albatross, Black-footed	*Diomedea nigripes*
951	Albatross, Laysan	*Diomedea immutabilis*
950	Albatross, Short-tailed	*Diomedea albatrus*
949	Albatross, Unid	*Diomedeidae*
983	Alcid, Unid	*Alcidae*
996	Auklet, Cassins	*Ptychoramphus aleuticus*
995	Auklet, Rhinoceros	*Cerorhinca monocerata*
900	Bird, Unid	*Aves*
912	Coot, American	*Fulica americana*
962	Cormorant, Brandts	*Phalacrocorax penicillatus*
963	Cormorant, Double-crested	*Phalacrocorax auritus*
964	Cormorant, Pelagic	*Phalacrocorax pelagicus*
961	Cormorant, Unid	*Phalacrocoracidae*
954	Fulmar, Northern	*Fulmarus glacialis*
945	Grebe, Horned	*Podiceps auritus*
942	Grebe, Red-necked	*Podiceps grisegena*
946	Grebe, Unid	*Podicipedidae*
943	Grebe, Western	*Aechmophorus occidentalis*
947	Guillemot, Pigeon	*Cepphus columba*
948	Guillemot, Unid	*Cepphus*
975	Gull, California	*Larus californicus*
979	Gull, Glaucous-winged	*Larus glaucescens*
978	Gull, Heermanns	*Larus heermanni*
977	Gull, Herring	*Larus argentatus*
980	Gull, Mew	*Larus canus*
981	Gull, Ring-billed	*Larus delawarensis*
974	Gull, Unid	*Larinae*
982	Gull, Western	*Larus occidentalis*
976	Kittiwake, Black-legged	*Rissa tridactyla*
941	Loon, Common	*Gavia immer*
940	Loon, Pacific	*Gavia pacifica*
939	Loon, Red-throated	*Gavia stellata*
944	Loon, Unid	*Gaviidae*
989	Murre, Common (Guillemot)	*Uria aalge*
987	Murre, Unid	*Uria*
993	Murrelet, Ancient	*Synthliboramphus antiquus*
994	Murrelet, Marbled	*Brachyramphus marmoratus*
910	Pelican, Brown	*Pelecanus occidentalis*
992	Puffin, Tufted	*Fratercula cirrhata*

Code	Common Name	Scientific Name
953	Shearwater, Black-vented	*Puffinus opisthomelas*
955	Shearwater, Pink-footed	*Puffinus creatopus*
957	Shearwater, Short-tailed	*Puffinus tenuirostris*
956	Shearwater, Sooty	*Puffinus griseus*
959	Storm-Petrel, Black	*Oceanodroma melania*
960	Storm-Petrel, Fork-tailed	*Oceanodroma furcata*
965	Storm-Petrel, Leachs	*Oceanodroma leucorhoa*
966	Storm-Petrel, Least	*Oceanodroma microsoma*
958	Storm-Petrel, Unid	*Hydrobatidae*
911	Tern, Caspian	*Sterna caspia*

Appendix E: Catch Categories and Target Strategies

Note: All catch categories may be used as a target strategy. Do not use target strategies as catch categories

Catch Category	Code	Catch Category	Code
Tuna, Albacore	ALBC	Perch, Pacific Ocean	POP
Flounder, Arrowtooth	ARTH	Sole, Petrale	PTRL
Rockfish, Bank	BANK	Whiting, Pacific	PWHT
Rockfish, Boccacio	BCAC	Greenling, Rock	RCKG
Sole, Butter	BSOL	Sole, Rex	REX
Cabezon	CBZN	Rockfish, WA or CA	ROCK
Halibut, California	CHLB	Sole, Rock	RSOL
Rockfish, Chilipepper	CLPR	Sablefish	SABL
Rockfish, Canary	CNRY	Salmon species	SAMN
Sole, Curlfin	CSOL	Sanddabs, Unspecified	SDAB
Rockfish, Cowcod	CWCD	Sheepshead	SHPD
Rockfish, Darkblotched	DBRK	Skates and Rays, All	SKAT
Crab, Dungeness	DCRB	Rockfish, Small (OR)	SMRK
Sole, Dover	DOVR	Rockfish, Splitnose	SNOS
Shark, Spiny Dogfish	DSRK	Shrimp and Prawns, All	SRMP
Sole, English	EGLS	Rockfish, NearshoreS	SSHR
Grenadier, Unspecified	GRDR	Rockfish, ShelfS	SSLF
Sturgeon, Green	GSTG	Rockfish, SlopeS	SSLP
Greenling, Kelp	KLPG	Sole, Sand	SSOL
Lingcod	LCOD	Thornyhead, Shortspine	SSPN
Rockfish, Large (OR)	LGRK	Shark, Soupfin	SSRK
Thornyhead, Longspine	LSPN	Flounder, Starry	STRY
Rockfish, NearshoreN	NSHR	Crab, Tanner	TCRB
Rockfish, ShelfN	NSLF	Thornyhead, Unspecified	THDS
Rockfish, SlopeN	NSLP	Mackeral, Unspecified	UMCK
Crab, Other	OCRB	Rockfish, Unspecified	URCK
Octopus, Unspecified	OCTP	Croaker, White	WCRK
Flatfish, Other	OFLT	Rockfish, Widow	WDOW
Shark, Other	OSRK	Eel, Wolf	WEEL
Whitefish, Ocean	OWFS	Sturgeon, White	WSTG
Cod, Pacific	PCOD	Rockfish, Yellowtail	YTRK
Halibut, Pacific	PHLB	Seabird	ZBRD
Pollock	PLCK	Miscellaneous, Unidentified	ZMIS
Mackeral, Pacific	PMCK	Mammal, Marine	ZMRM

Target Strategy	Code	Target Strategy	Code
Bottom Rockfish Shelf	BRSH	Miscellaneous	MSC2
Bottom Rockfish Slope	BRSL	Nearshore Mix	NSM
Dover/Thornyheads/Sablefish	DTS	Unknown	UNKN
Deepwater Dover	DWD		

Appendix F: Minor Rockfish Species

North of 40°10' N. lat.	South of 40°10' N. lat.
Nearshore	
black, Sebastes melanops	black, Sebastes melanops
black and yellow, S. chrysolmelas	black and yellow, S. chrysolmelas
blue, S. mystinus	blue, S. mystinus
brown, S. auriculatus	brown, S. auriculatus
calico, S. dallli	**California scorpionfish, Scorpaena guttata**
china, S. nebulosus	calico, S. dalli
copper, S. caurinus	china, S. nebulosus
gopher, S. carnatus	copper, S. caurinus
grass, S. rastrelliger	gopher, S. carnatus
kelp, S. atrovirens	grass, S. rastrelliger
olive, S. serranoides	kelp, S. atrovirens
quillback, S. maliger	olive, S. serranoides
treefish, S. serriceps	quillback, S. maliger
	treefish, S. serriceps
Shelf	
bronzespotted, S. gilli	bronzespotted, S. gilli
bocaccio, S. paucispinis	chameleon, S. phillipsi
chameleon, S. phillipsi	dwarf-red, S. refianus
chilipepper, S. goodie	flag, S. rubrivinctus
cowcod, S. levis	freckled, S. lentiginosus
dwarf-red, S. refianus	greenblotched, S. rosenblatti
flag, S. rubrivinctus	greenspotted, S. chlorostictus
freckled, S. lentiginosus	greenstriped, S. elongates
greenblotched, S. rosenblatti	halfbanded, S. semicinctus
greenspotted, S. chlorostictus	honeycomb, S. umbrosus
greenstriped, S. elongates	mexican, S. macdonaldi
halfbanded, S. semicinctus	pink, S. eos
honeycomb, S. umbrosus	pinkrose, S. simulator
mexican, S. macdonaldi	pygmy, S. wilsoni
pink, S. eos	redstriped, S. proriger
pinkrose, S. simulator	rosethorn, S. helvomaculatus
pygmy, S. wilsoni	rosy, S. rosaceus
redstriped, S. proriger	silvergrey, S. brevispinus
rosethorn, S. helvomaculatus	speckled, S. ovalis
rosy, S. rosaceus	squarespot, S. hopkinsi
silvergrey, S. brevispinus	starry, S. constellatus
speckled, S. ovalis	stripetail, S. csaxicola
squarespot, S. hopkinsi	swordspine, S. ensifer
starry, S. constellatus	tiger, S. nigorcinctus
stripetail, S. csaxicola	vermilion, S. miniatus
swordspine, S. ensifer	yelloweye, S. ruberrimus
tiger, S. nigorcinctus	**yellowtail, S. flavidus**
vermilion, S. miniatus	
yelloweye, S. ruberrimus	

Slope

aurora, S. aurora	aurora, S. aurora
bank, S. rufus	bank, S. rufus
blackgill, S. melanostomus	blackgill, S. melanostomus
darkblotched, S. crameri	darkblotched, S. crameri
redbanded, S. babcocki	**pacific ocean perch, S. alutus**
rougheye, S. aleutianus	redbanded, S. babcocki
sharpchin, S. zacentrus	rougheye, S. aleutianus
shortraker, S. borealis	sharpchin, S. zacentrus
splitnose, S. diploproa	shortraker, S. borealis
yellowmouth, S. reedi	yellowmouth, S. reedi

Rockfish Categories
Currently, many regulations are designed to lessen the impacts of fishing on certain species of rockfish. Rockfish (except thornyheads) are divided into categories north and south of 40°10' N. latitude, depending on the depth where they are often caught: nearshore, shelf, or slope.

"Nearshore" is defined (by the California Nearshore Fishery Management Plan) as the area from the high-tide line offshore to a depth of 120 ft (20 fm). "Shelf" refers to the continental shelf, while "slope" refers to the continental slope.

Note: Species listed in bold have their own catch category names when caught in the opposite region. For example, bocaccio rockfish is listed in bold in the Shelf rockfish list North of 40°10' N. lat., therefore north of 40°10' N. lat., bocaccio rockfish is listed under the catch category NSLF, and south of 40°10' N. lat., bocaccio is in its own catch category: BCAC.

Appendix G: WCGOP Codes

Gear Type

1 - Groundfish Trawl, Footrope < 8 inches (small footrope)
2 - Groundfish Trawl, Footrope > 8 inches (large footrope)
3 - Midwater Trawl
4 - Danish/ Scottish Seine (Trawl)
5 - Other Trawl Gear
6 - Longline or Setnet
7 - Vertical Hook and Line Gear
8 - Pole (Commercial)
9 - Other Hook and Line Gear
10 - Fish Pot
11 - Prawn Trawl
12 - Shrimp Trawl, Single Rigged
13 - Shrimp Trawl, Double Rigged
14 - All Net Gear Except Trawl
15 - All Troll Gear
16 - All Other Miscellaneous Gear
17 - Pineapple Trawl

Gear Performance

1 - No problem
2 - Pot was in the haul
3 - Net hung up
4 - Net ripped
5 - Trawl net or codend lost, pot(s) lost, other gear lost
7 - Other problem – Document other gear related problem in the comments section.

Weight Method

1 - Actual Weight
2 - Bin/ Trawl Alley Volume
3 - Basket Weight Determination (BWD)
4 - Visual Estimate
5 - OTC-Retained
6 - Other
7 - Vessel Estimate
8 - Extrapolation
9 - Length/ Weight Conversion
10 - Codend Estimate
11 - Retained + Discard
13 - Tally Sample

Sample Methods – Species Composition

1 - Whole Haul
2 - Single Basket
3 - Multiple basket (Document # of baskets)
4 - Fixed Gear Sample

Sample Methods – Biospeciemen & Length Frequency

6 - Outside and Nonrandom
7 - Outside and Random
8 - Inside and Nonrandom
9 - Inside and Random

Reason For Discard

1 - Prohibited
2 - Size
3 - Market
4 - Regulation
5 - Other
6 - Drop-off (Line gear only)
7 - Predation

Dissection Type

1 - Scales
2 - Otoliths
3 - Snouts
4 - Tissue

Appendix H: Random Number Table

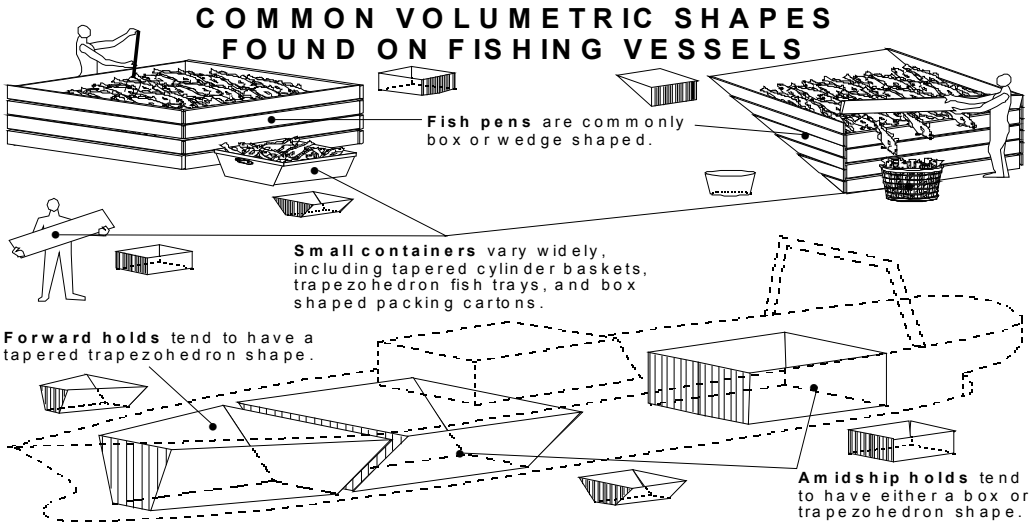
8	3	7	9	7	2	1	9	6	7	0	5	4	1	4	7	3	5	5	0	7
8	6	3	6	2	0	7	1	8	8	2	8	1	4	6	3	6	7	3	8	4
7	5	5	5	9	2	6	2	6	5	7	1	9	6	4	1	2	4	3	6	9
1	5	9	2	3	6	3	8	7	1	0	8	2	1	4	9	0	9	8	0	1
3	5	0	6	2	9	0	6	7	6	6	5	3	8	5	6	2	5	1	0	6
4	2	1	2	6	3	5	3	6	4	8	9	2	2	9	7	8	5	7	0	3
5	0	3	1	1	4	2	5	2	3	2	6	3	3	4	9	5	4	2	5	2
5	0	6	0	9	4	9	3	4	9	8	7	7	2	4	2	3	5	8	1	3
0	1	6	1	4	7	4	9	7	6	7	9	6	3	4	5	6	7	8	5	9
1	0	6	7	3	4	8	1	2	3	7	1	1	0	8	4	2	1	9	3	8
3	1	7	0	8	0	0	9	7	2	3	0	8	5	5	4	8	7	9	9	1
0	6	2	0	6	6	2	5	1	8	7	6	2	6	3	0	1	4	1	4	8
4	2	1	9	4	2	2	6	7	6	0	0	3	3	9	9	3	7	4	2	4
6	2	1	2	6	1	6	9	8	2	0	6	6	4	1	5	0	5	2	9	6
0	8	7	9	6	0	7	1	4	5	8	8	5	3	2	2	5	3	8	8	7
0	0	2	2	5	5	0	9	3	8	6	1	0	6	7	4	3	9	9	4	1
4	8	4	8	9	3	3	5	9	2	3	8	5	5	7	3	9	5	2	3	4
8	2	8	2	8	6	6	8	6	1	6	0	0	4	8	8	9	6	5	6	8
0	2	6	8	8	3	7	2	6	6	8	8	7	4	2	4	1	2	0	3	4
1	9	9	4	8	3	6	0	4	8	9	6	1	5	8	2	5	0	8	2	4

How to Use the Random Number Table

To use the random number table, enter the table at a random point. The easiest way to do this is by closing your eyes and placing your finger on the table. The column and row nearest your finger is the starting point. Determine how many digits in the row you are using: if you need numbers between 1 and 250, use three digits in the row. If you need numbers between 1 and 25, use two digits in the row, and so on. Decide in which direction you will move through the table. Then proceed in any direction through the table (even diagonally), recording appropriate numbers and skipping numbers too high or repeated, until you have enough random numbers. You should decide on a direction and enter the table at a different random starting point every time you use it.

For example, if you need to choose 3 numbers between 1 and 25, you could enter the table by placing your finger on the table to choose a column and row. Your criterion is two digit numbers between 01 and 25 (inclusive). For this example, you decided to work up the column from your starting point. As you move up the column, the first number you encounter is 14. This is a two-digit number between 01 and 25; it fits the criterion, so you write it down. The next number is 09; it also fits the criterion, so you write it down. The next number is 58 and does not fit the criterion so you skip this number. Keep moving up the column, skipping the numbers that do not fit the criterion, until you choose the all the numbers you need.

Appendix I: Weights, Measures, and Conversions



Abbreviations

inch (in)	millimeter (mm)	kilograms (kg)	minute (min)	foot (ft)
centimeter (cm)	metric ton (mt)	pounds (lbs)	meter (m)	liter (L)
ton (t)	kilometer (km)	quart (qt)	mile (mi)	celcius ©
latitude (lat)	farenheit (F)	grams (g)	longitude (lon)	

Weights and Measures

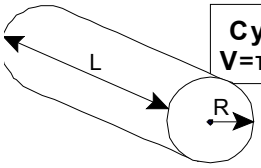
1 in = 2.540 cm 1cm = 10 mm = 0.3937 in
1 ft = 0.3048 m = 0.1667 fathoms 1m = 100 cm = 3.2808 ft = 0.5468 fathoms
1 fathom = 6 ft = 1.829 m 1000 m = 1 km = 0.6214 statute mi
1 L = 1.0567 U.S. qt
F° = (1.8 x C°) + 32C° = 5/9(F° - 32)
1 statute m = 5,280 ft = 1.609 km = 0.86899 nautical mi = 880 fathoms
1 nautical mi = 1.15078 statute mi = 1 min lat = 1.852 km = 1,012.6859 fathoms = 1,852 m
1 fathom = 0.0009875 nautical mi = 0.0011364 statute mi
1 lb = 0.4536 kg
total catch wt. in lbs ÷ 2.2046 = total catch wt. in kg
1 mt = 1,000 kg = 2204.6 lbs.

Area, Volume and Product Formulas

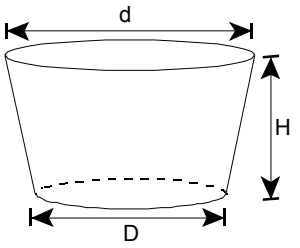
Number of Product Units x Average Unit Weight = Total Weight of Product
Area of a circle = πr^2 Circumference = $2\pi r$ (π = 3.1416)
Area of a square or rectangle = length × width
Area of a triangle = ½ X base X height
Volume of a right angle cone = 1/3 X $\pi r^2 h$
Volume of a Sphere = 4/3 X π X r^3
Length of the triangle hypotenuse "C" where A and B equal the length of the opposite two sides:
$A^2 + B^2 = C^2$

VOLUMETRIC FORMULAS

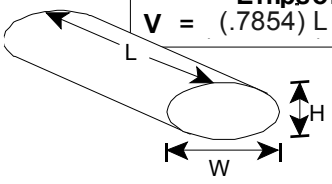
Cylinder
$V = \pi R^2 \times L$



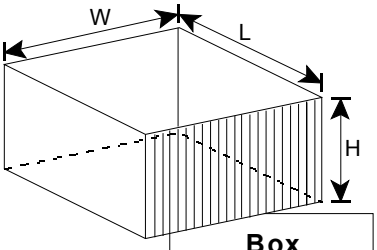
Tapered Cylinder
$V = 0.2618\ H\ (d^2 + D^2 + dD)$



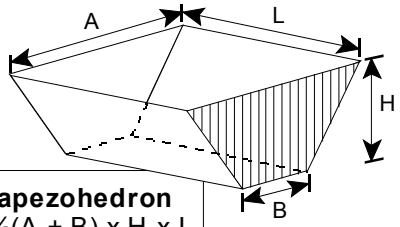
Ellipsoidal
$V = (.7854)\ L \times W \times H$



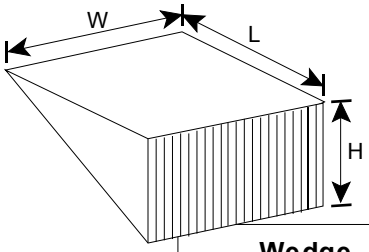
V = Volume
H = Height
L = Length
W = Width
π = 3.1416
D = Diameter
d = diameter
R = Radius



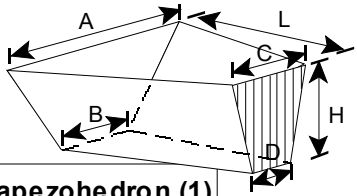
Box
$V = H \times L \times W$



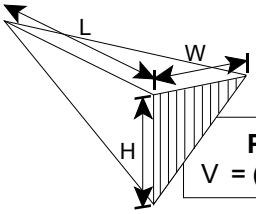
Trapezohedron
$V = \frac{1}{2}(A + B) \times H \times L$



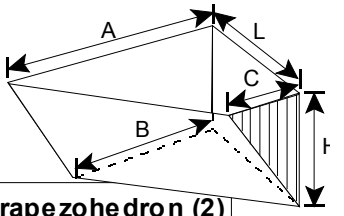
Wedge
$V = \frac{1}{2}(H \times L \times W)$



Tapered Trapezohedron (1)
$V = \frac{1}{4}(A + B + C + D) \times H \times L$



Pyramoidal
$V = (W \times L \times H) \div 6$



Tapered Trapezohedron (2)
$V = \frac{1}{4}(A + B + C) \times H \times L$

APPENDIX I

Appendix J: Pacific halibut Length/Weight Table

Centimeter	Pounds
10	0.02
11	0.02
12	0.02
13	0.04
14	0.04
15	0.07
16	0.07
17	0.09
18	0.11
19	0.13
20	0.15
21	0.18
22	0.20
23	0.24
24	0.26
25	0.31
26	0.35
27	0.40
28	0.46
29	0.51
30	0.57
31	0.62
32	0.71
33	0.77
34	0.84
35	0.93
36	1.01
37	1.10
38	1.21
39	1.32
40	1.43
41	1.59
42	1.68
43	1.81
44	1.94
45	2.09
46	2.25
47	2.43
48	2.58
49	2.76

Centimeter	Pounds
50	2.95
51	3.15
52	3.35
53	3.57
54	3.79
55	4.01
56	4.25
57	4.52
58	4.76
59	5.05
60	5.31
61	5.62
62	5.93
63	6.24
64	6.57
65	6.90
66	7.25
67	7.61
68	7.98
69	8.38
70	8.77
71	9.19
72	9.61
73	10.05
74	10.49
75	10.98
76	11.44
77	11.95
78	12.46
79	12.99
80	13.51
81	14.07
82	14.64
83	15.23
84	15.83
85	16.45
86	17.09
87	17.75
88	18.41
89	19.09

Centimeter	Pounds
90	19.80
91	20.53
92	21.25
93	22.02
94	22.80
95	23.59
96	24.41
97	25.24
98	26.08
99	26.96
100	27.87
101	28.77
102	29.70
103	30.67
104	31.64
105	32.63
106	33.64
107	34.68
108	35.74
109	36.84
110	37.94
111	39.07
112	40.21
113	41.38
114	42.59
115	43.81
116	45.06
117	46.32
118	47.62
119	48.94
120	50.29
121	51.65
122	53.07
123	54.48
124	55.93
125	57.41
126	58.91
127	60.43
128	61.99
129	63.56

Centimeter	Pounds
130	65.17
131	66.82
132	68.48
133	70.17
134	71.89
135	73.66
136	75.44
137	77.25
138	79.08
139	80.95
140	82.87
141	84.79
142	86.75
143	88.76
144	90.79
145	92.84
146	94.93
147	97.05
148	99.21
149	101.39
150	103.62
151	105.87
152	108.16
153	110.50
154	112.83
155	115.24
156	117.66
157	120.13
158	122.62
159	125.16
160	127.71
161	130.32
162	132.96
163	135.65
164	138.36
165	141.12
166	143.90
167	146.72
168	149.54
169	152.49
170	155.45

Centimeter	Pounds
171	158.42
172	161.44
173	164.51
174	167.60
175	170.75
176	173.92
177	177.14
178	180.40
179	183.71
180	187.06
181	190.46
182	193.87
183	197.36
184	200.86
185	204.43
186	208.03
187	211.67
188	214.71
189	218.50
190	222.89
191	226.70
192	230.56
193	234.48
194	238.45
195	242.44
196	246.50
197	250.60
198	255.74
199	258.93
200	263.17
201	267.46
202	271.79
203	276.17
204	280.60
205	285.10
206	289.62
207	294.21
208	298.84
209	303.51
210	308.25
211	313.03

Centimeter	Pounds
212	317.86
213	322.73
214	327.67
215	332.65
216	337.70
217	342.79
218	347.93
219	353.13
220	358.38
221	363.69
222	369.05
223	374.45
224	379.92
225	385.45
226	391.03
227	396.67
228	402.36
229	408.09
230	413.91
231	419.76
232	425.69
233	431.66
234	437.68
235	443.76
236	449.91
237	456.13
238	462.39
239	468.72
240	475.09
241	481.55
242	488.05
243	494.60
244	501.24
245	507.92
246	514.66
247	521.48
248	528.36
249	535.28
250	542.29

Appendix K: Injury Key for Trawl Caught Pacific Halibut

Key to Trawl Injury Codes for Pacific Halibut

1a. Fish is alive..... **Go to 2a**
1b. Fish is dead when sorted from the catch..... **Code DEAD**
Fish is in rigor and lifeless, even if no apparent injuries. Gills appear washed out, i.e., dull red, pink, or white in color. Mouth may contain sediment.

2a. Body of fish appears uninjured, or has only minor injuries... **Go to 3a**
2b. Injuries to fish are significant and obvious ..... **Code DEAD**
Body cavity is ripped open, exposing internal organs. Body tissue may be torn or ripped in a rough, ragged manner. Red hemorrhaging observed on 25% or more of the white side of fish.

3a. Fish is able to close operculum when stimulated..... **Go to 4a**
Operculum is closed strongly or weakly, but pressure is evident. Operculum may not stay closed for long, though pressure may last up to 5 seconds or longer.
3b. Fish cannot close operculum, even when stimulated ..... **Code DEAD**

4a. Fish displays activity and has muscle tone..... **Go to 5a**
Fish displays a minimal amount of activity, especially when stimulated. May be able to clench jaw tightly.
4b. Fish exhibits no muscle tone ..... **Code DEAD**

5a. Fish is not bleeding, or only slightly bleeding, if at all ..... **Go to 6a**
5b. Blood is flowing freely and continuously in large quantities (profusely)... **Code DEAD**
Bleeding is coming from a torn or severed gill arch, or a body injury.

6a. Body injuries are minimal, perhaps difficult to find..... **Go to 7a**
May consist of superficial nicks or cuts on body. Less than
10% of dorsal and anal fin area is frayed.
6b. Body injuries are readily apparent..... **Code POOR**
Skin is damaged with abrasions. Cuts and lacerations in body extend through the skin and just barely into the flesh (not deeply). Dorsal and anal fin area is frayed between 10-50%. Fin edges may be bleeding. Roughly 10-25% of the white side of fish shows red hemorrhaging.

7a. Operculum pressure is strong and sustained ..... **Go to 8a**
7b. Operculum pressure is weak and not sustained..... **Code POOR**

8a. Fish is strong and lively, displaying good muscle tone..... **Go to 9a**
Fish is flopping around the deck , hard to control. Jaw may be tightly clenched, difficult to open.
8b. Fish appears weak..... **Code POOR**
Movement is intermittent, perhaps occurring when provoked or stimulated. Body is limp.

9a. Fish is bleeding from gills..... **Code POOR**
Blood is flowing continuously, slow and steadily, but not profusely. Gills are deep to bright red in color.
9b. No bleeding observed..... **Code EXCELLENT**
Gills are deep red in color.

Appendix L: Injury Key for Pot Caught Pacific Halibut

Key to Pot Injury codes for Pacific Halibut

1a. Fish is alive..... **Go to 2a**
1b. Fish is dead when sorted from the catch ..... **Code DEAD**
Fish is in rigor and lifeless, even if no apparent injuries. Gills appear washed out, i.e., dull red, pink, or white in color.

2a. No penetration of the body or head by sand fleas..... **Go to 3a**
Membranes surrounding eyes and anus are intact, without any holes from sand fleas. A few sand fleas may be seen on body and can be wiped off with your hand. Typically, no penetration has occurred when only a few (e.g., <10) sand fleas are found on the body.
2b. Sand fleas have penetrated the body via the eyes, fins, or anus..... **Code DEAD**
Membrane surrounding eye may be partially or completely missing. Dorsal and/or anal fin membranes may be eaten away, leaving fin rays exposed. Skin on the body is separated from tissue where sand fleas have eaten.

3a. No predation of the fish's body by crabs in the pot is noted..... **Go to 4a**
3b. Predation by crabs has occurred…..... **CODE DEAD**
Crabs in the pot may have attacked and eaten the fish.

4a. Body of fish appears uninjured, or has only minor injuries..... **Go to 5a**
4b. Injuries to fish are obvious and significant..... **Code DEAD**
Body cavity is ripped open, exposing internal organs. Body tissue may be torn or ripped in a rough, ragged manner. Red hemorrhaging observed on 25% or more of the white side of fish.

5a. Fish is able to close operculum when stimulated ..... **Go to 6a**
Operculum is closed strongly or weakly, but pressure is evident. Operculum may not stay closed for long, though pressure may last up to 5 seconds or longer.
5b. Fish cannot close operculum, even when stimulated..... **Code DEAD**

6a. Fish displays activity and has muscle tone ..... **Go to 7a**
Fish displays a minimal amount of activity, especially when stimulated. May be able to clench jaw, perhaps tightly.
6b. Fish exhibits no muscle tone ..... **Code DEAD**
Physical activity absent or limited to fin ripples or twitches. Little, if any, response to stimuli. Jaw is hanging open and is slack.

7a. Fish is not bleeding, or only slightly bleeding, if at all ..... **Go to 8a**
7b. Blood is flowing freely and continuously in large quantity (profusely) .... **Code DEAD**
Bleeding is coming from fin edges or a body injury.

8a. Body injuries are minimal, perhaps difficult to find..... **Go to 9a**
May consist of superficial nicks or cuts on body. Less than 10% of dorsal and anal fin area is frayed. Hemorrhaging of skin on white side limited to 5-10% of surface area.

8b. Body injuries are readily apparent.....…….. **Code POOR**
Skin is damaged with abrasions. Cuts and lacerations in body extend through the skin and just barely into the flesh (not deeply). Dorsal and anal fin area is frayed between 10-50%. Fin edges may be bleeding slightly. Roughly 10-25% of the white side of fish shows red hemorrhaging.

9a. Operculum pressure is strong and sustained .....…….. **Go to 10a**
Fish should be able to close operculum for at least 5-10 seconds.
9b. Operculum pressure is weak and not sustained.....……... **Code POOR**

10a. Fish is strong and lively, displaying good muscle tone.....…….. **Go to 11a**
Fish is flopping around the deck, hard to control. Jaw may be tightly clenched, difficult to open.
10b. Fish appears weak .....…… **Code POOR**
Movement is intermittent and of short duration. Perhaps occurring when provoked or stimulated. Body appears limp, not in rigor mortis.

11a. Fish is bleeding from fin edges or body.....…….. **Code POOR**
Blood is oozing continuously from fin edges or body wounds. Gills are deep to bright red in color.
11b. No bleeding observed..... .. **Code EXCELLENT**
Gills are deep red in color. Fins are not bleeding.

Appendix M: Injury Key for Hook & Line Caught Pacific Halibut

Injury Key for Hook & Line Caught Pacific Halibut

1a. Fish is alive..... **Go to 2a**
1b. Fish is dead when brought to the surface on the gear ..... **Code DEAD**
Fish is in rigor and lifeless, even if no apparent injuries. Gills appear completely devoid of blood (light pink or white in color).

2a. Body shows no signs of marine mammal predation ..... **Go to 3a**
Fish's body is intact. Flesh may be torn, but no missing tissue.
2b. Body is missing pieces of flesh..... **Code DEAD**
Pieces of tissue are missing from predation by marine mammals.
Missing pieces are typical of bites from sea lions or other large marine mammals.

3a. No penetration of the body or head by sand fleas..... **Go to 4a**
Membranes surrounding eyes and anus are intact, without any holes from sand fleas. A few sand fleas may be seen on body and can be wiped off with your hand. Typically, no penetration occurs when only a few (e.g., <10) sand fleas are found on the body.
3b. Sand fleas have penetrated the body via the eyes, fins, or anus..... **Code DEAD**
Membrane surrounding eye may be partially or completely missing. Dorsal and/or anal fin membranes may be eaten away, leaving finrays exposed. Skin on the body is separated from tissue where sand fleas have eaten.

4a. No wounds of any kind to abdominal organs. Abdominal wall not punctured…. **Go to 5a**
4b. Abdominal organs are damaged, possibly by a gaff ..... **Code DEAD**
Abdominal cavity wall is punctured or torn. Viscera are visible and exposed, and may be protruding.

5a. Fish is not bleeding from gills (but may be bleeding from elsewhere)..... **Go to 6a**
5b. Fish is bleeding from gills..... **Code DEAD**
Bleeding is occurring from a torn or severed gill arch.

6a. Fish is not bleeding at all, or bleeding is minor to moderate (not from gills)…… **Go to 7a**
Blood may be seen around mouth and/or jaw. Blood may be oozing continuously, or bleeding may be continuing very slowly a few drops at a time, or bleeding may have stopped.
6b. Bleeding is severe ..... **Code DEAD**
Blood from any source is flowing freely and continuously in large quantity.

7a. Injuries to head and/ or jaw are minor to moderate..... **Go to 8a**
No structures are missing
7b. Major injuries to head and jaw, resulting in missing pieces..... **Code SEVERE**
Side of the head, possibly including the jaw, has been torn loose and missing from the fish, and/or lower jaw has been torn away and is missing.

8a. Wounds to the head (forward of preopercle and above cheek and jaw) are only surface scratches on the skin ..... **Go to 9a**
8b. Skin on head (forward of preopercle) is ripped and torn deeply..... **Code SEVERE**

Internal organs are likely exposed.

9a. Eye or eye socket is not punctured..... **Go to 10a**
9b. Eye or eye socket is punctured ..... **Code MODERATE**

10a. No wounds to the body are evident..... **Go to 11a**
10b. Wounds in body consist of puncture holes in skin, with possibly a flesh tear..... **Code MODERATE**

11a. Lower jaw is significantly damaged..... **Code MODERATE**
Lower jaw may be broken into 2 pieces at the snout, but each is still attached at the base of the jaw. Jaw may be torn on one side or the other, possibly extending through the cheek.
11b. Damage to lower jaw, if any, is slight..... **Code MINOR**
Injuries include the hook entrance/exit hole around the jaw or in the cheek, or a tear in the cheek. A piece of the lip may be torn and hanging from the jaw. If gangion was cut, the hook and some length of residual gangion may be hanging from the mouth.

Appendix N: List of Observer-Issued Equipment

Safety Gear

Immersion suit
EPIRB
Inflattable Life Vests
Emergency Strobes
Whistle
Hardhats
Earplugs
Knee pads
Knee Pads
Back Brace

Sampling Gear

Platform Scale
Brass 6 lbs. Scale
Brass 25 lbs. Scale
5lb Scale Calibration Weight
Pelican Case for Scale
Headlamp
Disposable Camera
5 Gallon Plastic Buckets
Bucket Lid
Observer Sampling Baskets
Observer Sampling Basket Lid
Victorinox Knives
Spyderco Knife
Fish Pick
Forceps
Scalpel
Clipboard
Hand Counter
Length Frequency Board
Length Frequency Strips
Marine Mammal Tissue Sampling Kit
Measuring Tape Reel
Species ID Guides
Calcualtors

Appendix O: 50 CFR Part 660 Observer Program Regulations

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 660

[Docket No. 000301054–1054; I.D. 053000D]

RIN 0648–AN27

Fisheries off West Coast States and in the Western Pacific; Pacific Coast Groundfish Fishery; Groundfish Observer Program

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS issues this final rule to amend the regulations implementing the Pacific Coast Groundfish Fishery Management Plan (FMP) to provide for an at-sea observation program on all limited entry and open access catcher vessels. This final rule requires vessels in the groundfish fishery to carry observers when notified by NMFS or its designated agent; establishes notification requirements for vessels that may be required to carry observers; and establishes responsibilities and defines prohibited actions for vessels that are required to carry observers. The at-sea observation program is intended to improve estimates of total catch and fishing mortality.

DATES: Effective May 24, 2001.

ADDRESSES: Copies of the Environmental Assessment/Regulatory Impact Review/Final Regulatory Flexibility Analysis (EA/FRFA) may be obtained from the Pacific Fishery Management Council (Council) by writing to the Council at 2130 SW Fifth Avenue, Suite 224, Portland OR 97201, or by contacting Don McIsaac at 503– 326–6352, or may be obtained from William L. Robinson, Northwest Region, NMFS, 7600 Sand Point Way N.E., BIN C15700, Bldg. 1, Seattle, WA 98115–0070. Send comments regarding the reporting burden estimate or any other aspect of the collection-of-information requirements in this final rule, including suggestions for reducing the burden, to one of the NMFS addresses and to the Office of Management and Budget (OMB), Washington, D.C. 20503 (ATTN: NOAA Desk Officer).

FOR FURTHER INFORMATION CONTACT:

William L. Robinson, Northwest Region, NMFS, 206–526–6140; fax: 206–526– 6736 and e-mail: bill.robinson@noaa.gov or Svein Fougner, Southwest Region, NMFS, 562–980–4000; fax: 562–980–4047 and e-mail: svein.fougner@ noaa.gov.

SUPPLEMENTARY INFORMATION:

Electronic Access

This **Federal Register** document is also accessible via the Internet at the Office of the Federal Register's website at *http://www.access.gpo.gov/su—docs/ aces/aces140.html.*

Background

The U.S. groundfish fisheries off the Washington, Oregon, and California coasts are managed pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801-1883) and the Pacific Coast Groundfish FMP. Regulations implementing the FMP appear at 50 CFR Part 660, Subpart G. The Magnuson-Stevens Act at 16 U.S.C. 1853(b)(8) provides that an FMP may require that one or more observers be carried on-board a vessel of the United States engaged in fishing for species that are subject to the FMP, for the purpose of collecting data necessary for the conservation and management of the fishery. The Pacific Coast Groundfish FMP provides that all fishing vessels operating in the groundfish fishery may be required to accommodate on-board observers for purposes of collecting scientific data. Under the Magnuson-Stevens Act at 16 U.S.C. 1855(d), the Secretary of Commerce, acting through NMFS, has general responsibility to carry out any fishery management plan, and may promulgate such regulations as may be necessary to carry out this responsibility.

With the exception of the mid-water trawl fishery for Pacific whiting, most groundfish vessels sort their catch at sea and discard species that are in excess of cumulative trip limits, unmarketable, in excess of annual allocations, or incidentally caught non-groundfish species. Landed or retained catch is monitored by individual state fish ticket programs in Washington, Oregon, and California. However, because a portion of the catch is discarded at sea, there is no opportunity for NMFS or the states to monitor total catch (retained plus discarded catch) at onshore processing facilities. This lack of information on at-sea discards has resulted in imprecise estimates of total catch and fishing mortality.

Discard information is needed to assess and account for total fishing mortality and to evaluate management measures, including rebuilding plans for over fished stocks. Discard estimates based on limited studies conducted in the mid-1980's, and information on species compositions in landings, are available for some groundfish species. For other species, there is little or no discard information. During the past decade, there have been significant reductions in cumulative trip limits, and trip limits have been applied to increasing numbers of species. In light of these changes in the regulatory regime, doubt has been raised by the Council, NMFS, and the industry about the old discard estimates, which were based on data collected in the 1980's. Accurate estimates of discards are essential to computing total catch, and thus are an important component of any fishery conservation and management program. If the discard estimates are too high, harvest allocations may be set too low; if discard estimates are too low, then harvest allocations may be set too high, and the long-term health of the stock may be jeopardized.

Observers are a uniformly trained group of qualified technicians. They are stationed aboard vessels to gather conservation and management data that are too burdensome for vessel personnel to collect, and which would otherwise not be available for managing the fisheries or assessing interactions with non-groundfish species. The purposes of this final rulemaking are to establish the obligations of vessels that will be required to carry observers; to safeguard the observers' well-being; and to provide for sampling conditions necessary for an observer to follow scientific sampling protocols and thereby maintain the integrity of observer data collections. Nationwide regulations addressing vessels with conditions that are unsafe or inadequate for purposes of carrying an observer are found at 50 CFR 600.746. Nationwide regulations applicable to observers are also found under "General Prohibitions" at 50 CFR 600.725 (o),(r), (s), (t), and (u).

A proposed rule was published on September 14, 2000 (65 FR 55495). Further background information was presented in the preamble of the proposed rule. Public comment on the proposed rule was invited through October 16, 2000. NMFS received three letters containing comments. Two of the three letters, one from the United States Coast Guard and one from the United States Fish and Wildlife Service, expressed support for the proposed observer program. The third letter expressed support, but also expressed concern about funding mechanisms. At its June 2000 Council

meeting, the Council reviewed the observer program and encouraged the public to comment on the proposed rulemaking. One individual provided comment during public hearing at the June Council meeting. The comments are summarized below followed by NMFS' responses to those comments.

Changes to the Final Rule From the Proposed Rule

The final rule includes the following changes from the proposed rule:

1. Section 660.360 (a) was revised forclarity.
2. In Section 660.360 (c)(2) language was added to clarify that vessels using exempted gear types could be required to carry an observer under this rulemaking.
3. Section 660.360 (c)(2)(i) was revised for clarity.
4. Section 660.360 (c)(2)(i)(A), addressing departure reports, is revised from the proposed rule to include language that is intended to provide greater flexibility to vessels that are in port less than 24 hours from the time offloading of catch from one fishing trip begins until the time the vessel departs on the following fishing trip. Because such vessels expect to be on the fishing grounds at the time that they are required to submit the next departure report, the owner, operator, or manager of a vessel is given the option of providing notification to NMFS or its designated agent before departing on the trip prior to that which the observer coverage may be needed and again at the time offloading of the catch from the previous fishing trip begins.
5. Section 660.360 (c)(2)(i)(B), addressing departure reports, is revised from the proposed rule to include language that is intended to provide greater flexibility to vessels that intend to depart on a fishing trip less than 24 hours after weather or sea conditions allow for departure. This change was made in response to comment 3 (below). The West Coast groundfish fleet is composed of many small vessels, whose fishing schedules are heavily influenced by weather and sea conditions. To avoid departure delays, the owner, operator, or manager of a vessel who intends to depart on a fishing trip less than 24 hours after weather or sea conditions become favorable, may choose to inform NMFS or its agent of his/her intentions at least 24 hours before the expected departure time. After the initial notification, only an update 4 hours before the expected departure time would be required.

Comments and Responses

Comment 1: The rulemaking is too narrow; it focuses only on observers as a means for collecting the necessary data at sea.

Response: Other approaches for obtaining total catch data include full retention and data sampling by vessel personnel. NMFS believes that data collected under these approaches would not meet the defined management need without adequate verification, such as video systems for monitoring full retention or observer data to compare to vessel-collected data. Video surveillance systems connected to global positioning systems are useful in tracking activity by area fished, but do not provide the necessary total catch data. New digital camera technology has improved the ability to provide species-specific catch information in particular situations (e.g., fixed gear fisheries with a small variety of species). The technology is still early in development and is generally considered to be supplemental to an observer program.

Comment 2: Some boats may not have the ability to carry an observer. Page 19 of the EA notes that if it is determined that a vessel is simply too small to accommodate an observer alternative methods of sampling may need to be considered. Under these rules, some sectors of the fishery are opted right out of any observer program or any meaningful observation without alternatives such as cameras, or somebody in a zodiac, or full retention, or something like that. Moving forward with an observer program does not preclude further development of other approaches for obtaining the necessary total catch data.

Response: Vessel safety and accommodations are individual vessel issues and are not ones that can be easily addressed. NMFS recognizes that it is likely that some, particularly the smallest groundfish vessels, may not be safe or adequate for carrying observers. Page 19 of the EA notes that if it is determined that a vessel cannot safely accommodate an observer, alternative methods of sampling

may need to be considered. This final rulemaking does not preclude further development of alternative sampling methods for vessels that are determined to be unsuitable for observers.

Comment 3: If you are one of those that is required to have an observer and you do not know 24 hours in advance when you are going, because you are looking for the weather to break, that means a lot of times in the winter that you won't go fishing because you cannot get an observer.

Response: A departure report is necessary for NMFS or its designated agent to identify which vessels need to carry observers and to coordinate the placement of observers aboard vessels. It is necessary for vessel owners, operators or representatives to submit these reports because only they can make statements about their future intent. NMFS recognizes that vessels need to wait for favorable weather and sea conditions before departing on fishing trips. Language has been added to the rule in section 660.360(c)(2)(i)(B) to obtain the necessary information to ensure that an observer is available while allowing for possible delays in vessel schedules as a result of poor weather or sea condition. The initial contact between NMFS and the individual representing the vessel is still necessary to identify that the vessel intends to depart for fishing, when the weather or sea conditions are favorable. As conditions improve, the individual representing the vessel need only provide 4 hours notice before the anticipated departure.

Comment 4: In various places in the EA, it suggests that the program is contingent on Federal funding. If a program is contingent on Federal funding, it would violate the Magnuson Stevens Fishery Conservation and Management Act.

Response: NMFS disagrees with this comment. Nowhere in the rulemaking documents or in the EA does it state that an observer program is contingent on Federal funding. This final rulemaking establishes the framework necessary to support an at-sea observer program. It includes regulations that require vessels to carry observers when notified, provide notification of fishing schedules, provide food and accommodations, and a suitable location for observers to safely collect sample data according to scientific sampling protocols. The analysis examined the impacts resulting from a federally funded program because no additional rulemaking would be required before a program could be implemented if it were federally funded. Therefore, Federal funding was analyzed to facilitate the implementation of an observer program should Federal funding become available. This final rulemaking does not preclude NMFS or the Council from exploring alternative funding options or from providing fishermen with greater compensation for all or a portion of the costs of carrying an observer. Such measures would build upon this final rulemaking and would require additional rulemaking and analysis before implementation.

Classification

NMFS prepared an EA for this final rule and concluded that there will be no significant impact on the human environment as a result of this final rule. This final rulemaking will have no direct biological or physical impacts on the environment. It is NMFS's intention, to provide for observer training and the direct costs of deploying observers including salaries, payroll taxes, employment insurance, medical insurance, pension, and travel costs. The observers' employer will provide protection and indemnity insurance to cover bodily injury or property damage claims that may result from actions of the observer. Vessels will be responsible for providing information regarding their fishing schedule, and food and accommodations, for the observers. Some of the smallest groundfish vessels may find that crew members are displaced because limited bunk space must be allocated to the observer. Vessels will also need to provide adequate sampling facilities and unobstructed access to catch. This may result in increased handling time if sorting of the catch needs to be slowed or centralized to allow an observer to collect samples. Space requirements for analyzing and storing samples may reduce the available work and storage space for vessel activities. It is likely that the smallest groundfish vessels would be most affected by space requirements for analyzing and storing samples. However, without minimal sample space, data quality cannot be assured. The safety, health, and wellbeing of observers while stationed aboard fishing vessels is of the utmost importance. When this final rule is implemented, observer health and safety provisions at 50 CFR 600.725 and 600.746 will apply. A copy of the EA is available from NMFS (see **ADDRESSES**).

NMFS prepared a FRFA describing the impact of the action on small entities. For the purposes of the analysis, all catcher vessels were considered small entities.

This final rulemaking creates the regulatory framework needed to support an on-board observer program and is not predicated on a particular funding mechanism. Federal funding is available for 2001 and NMFS intends to provide for observer training and the direct costs of deploying observers including: salaries, payroll taxes, employment insurance, medical insurance, and travel costs. Observers would be employed directly by NMFS or through a contractor approved by NMFS. The observer's employer will provide protection and indemnity insurance to cover property damage claims that may result from actions of the observer. The individual vessel will be responsible for observer subsistence costs. Costs to the vessel that are analyzed in conjunction with this final rule are costs other than those that would be paid by NMFS. If NMFS chooses to use other funding mechanisms in the future, including shifting costs to the vessels, additional rulemaking would be required.

The costs to industry to deploy observers will vary depending on the coverage strategy that is selected. Three approaches that could be taken in developing a coverage plan include: random selection of trips from a large pool of vessels; complete sampling of all trips taken by a small number of vessels over a specific period; or sampling a portion of trips by an intermediate number of vessels over a specific period. The FRFA states that the impacts of the rule on individual vessels would depend on the nature and size of the program and the coverage approach that is chosen - all vessels in the groundfish fleet or a small portion of the vessels.

Of the 2,116 vessels in the open access and limited entry (LE) fisheries, the number of vessels that could be required to carry an observer annually ranges from 60 (if each observer samples one LE vessel over an entire cumulative trip limit period) to 967 (if observers sample vessel trips at random, no vessel is sampled more than once, and each vessel requires two observers to have all days sampled), depending on the coverage strategy that is employed. The FRFA indicates that the costs to the individual vessel are expected to range between $157 and $3334, depending on the coverage strategy and the number of days fished per year. An upper value of $11,044 per vessel is an extreme that would only occur if a vessel fished every day of the year and carried an observer at all times.

It is most likely that the open access and limited entry groundfish fleets would be divided into sampling sectors based on criteria such as gear type, fishing period, geographical location, or fishing strategy. Each sector may be required to have a different level of observer coverage. Sectors with the greatest annual catch of groundfish or those that most frequently interact with priority species, for which there is a serious need for information, could be required to have a substantially higher proportion of observer coverage than the other sectors. The analysis assumes that only vessels that carry an observer would bear the burden. Among the 2,116 vessels in the open access and limited entry groundfish fisheries that could be selected to bear the cost to carry an observer, there are substantial differences in terms of the annual ex-vessel value of their catch, and therefore in the burden imposed.

There were two alternatives considered in this final rulemaking:
Status quo, and adoption of regulations to support an observer program. Under the status quo alternative, a program could be designed where vessels carry observers on a voluntary basis. However, this would be a voluntary program with no way to ensure that a specific coverage plan could be followed or the integrity of the data collections maintained. Discard information needed to assess and account for total fishing mortality and to evaluate management measures is considered by NMFS to be deficient under a status quo alternative. Adopting regulations for an at-sea observer program on all limited entry and open access catcher vessels establishes the framework for a mandatory observer program, i.e., obligations of vessels that will be required to carry observers; safeguarding the observers' well-being; and providing for sampling conditions necessary for an observer to follow scientific sampling protocols and thereby maintain the integrity of observer data collections.

The Magnuson-Stevens Act at 16 U.S.C. 1853(b)(8) provides that an FMP may require that one or more observers be carried on board a vessel of the United States engaged in fishing for species

that are subject to the plan, for the purpose of collecting data necessary for the conservation and management of the fishery. On March 3, 1999, NMFS determined that the bycatch provisions in Amendment 11 failed to respond meaningfully to the bycatch requirements at Section 303 (a)(11) of the Magnuson-Stevens Act, which state that an FMP must "establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority—(A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided." Establishing an observer program to collect total catch data would bring the Pacific coast groundfish FMP closer to the Magnuson-Stevens Act bycatch requirements for a standardized reporting methodology on bycatch. A copy of this analysis is available from NMFS (see **ADDRESSES**).

This final rule contains a collection-of-information requirement subject to the Paperwork Reduction Act (PRA). This collection of information requirement has been approved by OMB under control number 0648–0423. Public reporting burden for these collections of information is estimated to average 5 minutes for making a toll-free call to provide either notification of departure on a fishing trip or notification of intent to cease participating in the fishery. This estimate includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding these burden estimates or any other aspect of the data collection, including suggestions for reducing the burden, to NMFS (see **ADDRESSES**) and to OMB, Washington, DC 20503 (ATTN: NOAA Desk Officer).

Notwithstanding any other provision of the law, no person is required to respond to, nor shall a person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB control number.

NMFS issued Biological Opinions (BOs) under the Endangered Species Act on August 10, 1990, November 26, 1991, August 28, 1992, September 27, 1993, May 14, 1996, and December 15, 1999, pertaining to the effects of the groundfish fishery on chinook salmon (Puget Sound, Snake River spring/ summer, Snake River fall, upper Columbia River spring, lower Columbia River, upper Willamette River, Sacramento River winter, Central Valley, California coastal), coho salmon (Central California coastal, southern Oregon/northern California coastal, Oregon coastal), chum salmon (Hood Canal, Columbia River), sockeye salmon (Snake River, Ozette Lake), steelhead (upper, middle and lower Columbia River, Snake River Basin, upper Willamette River, central California coast, California Central Valley, south-central California, southern California), and cutthroat trout (Umpqua River, southwest Washington/Columbia River). NMFS has concluded that implementation of the FMP for the Pacific Coast groundfish fishery is not expected to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or to result in the destruction or adverse modification of critical habitat.

NMFS has re-initiated consultation on the Pacific whiting fishery associated with the BO issued on December 15, 1999. During the 2000 whiting season, the whiting fisheries exceeded the chinook bycatch amount specified in the BO's incidental take statement's incidental take estimates (11,000 fish) by approximately 500 fish. The reinitiation will focus primarily on additional actions that the whiting fisheries would take to reduce chinook interception, such as time/area management. NMFS expects that the re-initiated BO will be completed by May 2001. During the reinitiation, fishing under the FMP is within the scope of the December 15, 1999, BO, so long as the annual incidental take of chinook stays under the 11,000 fish bycatch limit. NMFS has concluded that implementation of the FMP for the Pacific Coast groundfish fishery is not expected to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS, or result in the destruction or adverse modification of critical habitat. This final rule implements a data collection program and is within the scope of these consultations. Because the impacts of this action fall within the scope of the impacts considered in these BOs, additional consultations on these species are not required for this action.

This action implements a data collection program and is not expected to result in any adverse effects on marine mammals.

This final rule has been determined to be significant for purposes of Executive Order 12866.

List of Subjects in 50 CFR Part 660

Administrative practice and procedure, American Samoa, Fisheries, Fishing, Guam, Hawaiian Natives, Indians, Northern Mariana Islands, Reporting and recordkeeping requirements.

Dated: April 18, 2001.

John Oliver,

Acting Assistant Administrator for Fisheries, National Marine Fisheries Service.

For the reasons set out in the preamble, NMFS amends 50 CFR part 660 to read as follows:

PART 660—FISHERIES OFF WEST COAST STATES AND IN THE WESTERN PACIFIC

1. The authority citation for part 660continues to read as follows:

Authority: 16 U.S.C. 1801 *et seq.*

2. In § 660.302, the definitions for "Active sampling unit," and "Vessel manager" are added in alphabetical order to read as follows:

§ 660.302 Definitions.

Active sampling unit means a portion of the groundfish fleet in which an observer coverage plan is being applied.

* * * * *

Vessel manager means a person or group of persons whom the vessel owner has given authority to oversee all or a portion of groundfish fishing activities aboard the vessel.

3. In § 660.306, paragraph (y) is added to read as follows:

§ 660.306 Prohibitions.

* * * * *

(y) *Groundfish observer program.* (1) Forcibly assault, resist, oppose, impede, intimidate, harass, sexually harass, bribe, or interfere with an observer.

(2) Interfere with or bias the sampling procedure employed by an observer, including either mechanically or physically sorting or discarding catch before sampling.

(3) Tamper with, destroy, or discardan observer's collected samples, equipment, records, photographic film, papers, or personal effects without the express consent of the observer.

(4) Harass an observer by conduct that:

(i) Has sexual connotations,

(ii) Has the purpose or effect of interfering with the observer's work performance, and/or

(iii) Otherwise creates an intimidating, hostile, or offensive environment. In determining whether conduct constitutes harassment, the totality of the circumstances, including the nature of the conduct and the context in which it occurred, will be considered. The determination of the legality of a particular action will be made from the facts on a case-by-case basis.

(5) Fish for, land, or process fishwithout observer coverage when a vessel is required to carry an observer under § 660.360(c).

(6) Require, pressure, coerce, orthreaten an observer to perform duties normally performed by crew members, including, but not limited to, cooking, washing dishes, standing watch, vessel maintenance, assisting with the setting or retrieval of gear, or any duties associated with the processing of fish, from sorting the catch to the storage of the finished product.

(7) Fail to provide departure or cease fishing reports specified at §660.360(c)(2).

(8) Fail to meet the vessel responsibilities specified at §660.360(d).

4. Section 660.360 is added to subpart G to read as follows:

§ 660.360 Groundfish observer program.

(a) *General.* Vessel owners, operators, and managers are jointly and severally responsible for their vessel's compliance with this section.

(b) *Purpose.* The purpose of the Groundfish Observer Program is to allow observers to collect fisheries data deemed by the Northwest Regional Administrator, NMFS, to be necessary and appropriate for management, compliance monitoring, and research in the groundfish fisheries and for the conservation of living marine resources and their habitat.

(c) *Observer coverage requirements—*

(1) *At-sea processors.* [Reserved]

(2) *Catcher vessels.* For the purposes of this section, catcher vessels include all vessels, using open access or limited entry gear (including exempted gear types) that take and retain, possess or land groundfish at a processor(s) as defined at § 660.302. When NMFS notifies the vessel owner, operator, permit holder, or the vessel manager of any requirement to carry an observer, the vessel may not take and retain, possess, or land any groundfish without carrying an observer.

(i) *Notice of departure—Basic rule.* At least 24 hours (but not more than 36 hours) before departing on a fishing trip, a vessel that has been notified by NMFS that it is required to carry an observer, or that is operating in an active sampling unit, must notify NMFS (or its designated agent) of the vessel's intended time of departure. Notice will be given in a form to be specified by NMFS.

(A) *Optional notice—Weather delays.* A vessel that anticipates a delayed departure due to weather or sea conditions may advise NMFS of the anticipated delay when providing the basic notice described in paragraph (c)(2)(i) of this section. If departure is delayed beyond 36 hours from the time the original notice is given, the vessel must provide an additional notice of departure not less than 4 hours prior to departure, in order to enable NMFS to place an observer.

(B) *Optional notice—Back-to-back fishing trips.* A vessel that intends to make back-to-back fishing trips (i.e., trips with less than 24 hours between offloading from one trip and beginning another), may provide the basic notice described in paragraph (c)(2)(i)) of this section for both trips, prior to making the first trip. A vessel that has given such notice is not required to give additional notice of the second trip.

(ii) *Cease fishing report.* Not more than 24 hours after ceasing the taking and retaining of groundfish with limited entry or open access gear in order to leave the fishery management area or to fish for species not managed under the Pacific Coast Groundfish Fishery Management Plan, the owner, operator, or vessel manager of each vessel that is required to carry an observer or that is operating in a segment of the fleet that NMFS has identified as an active sampling unit must provide NMFS or its designated agent with notification as specified by NMFS.

(3) *Vessels engaged in recreational fishing.* [Reserved]

(4) *Waiver.* The Northwest Regional Administrator may provide written notification to the vessel owner stating that a determination has been made to temporarily waive coverage requirements because of circumstances that are deemed to be beyond the vessel's control.

(d) *Vessel responsibilities.* An operator of a vessel required to carry one or more observer(s) must provide:

(1) *Accommodations and food.* Provide accommodations and food that are:

(i) *At-sea processors.* [Reserved]

(ii) *Catcher vessels.* Equivalent to those provided to the crew.

(2) *Safe conditions.* Maintain safe conditions on the vessel for the protection of observer(s) including adherence to all U.S. Coast Guard and other applicable rules, regulations, or statutes pertaining to safe operation of the vessel, and provisions at §§ 600.725 and 600.746 of this chapter.

(3) *Observer communications.* Facilitate observer communications by:

(i) *Observer use of equipment.* Allowing observer(s) to use the vessel's communication equipment and personnel, on request, for the entry, transmission, and receipt of work-related messages, at no cost to the observer(s) or the United States or designated agent.

(ii) *Communication equipment requirements for at-sea processing vessels.* [Reserved]

(4) *Vessel position.* Allow observer(s) access to, and the use of, the vessel's navigation equipment and personnel, on request, to determine the vessel's position.

(5) *Access.* Allow observer(s) free and unobstructed access to the vessel's bridge, trawl or working decks, holding bins, processing areas, freezer spaces, weight scales, cargo holds, and any other space that may be used to hold, process, weigh, or store fish or fish products at any time.

(6) *Prior notification.* Notify observer(s) at least 15 minutes before fish are brought on board, or fish and fish products are transferred from the vessel, to allow sampling the catch or observing the transfer, unless the observer specifically requests not to be notified.

(7) *Records.* Allow observer(s) to inspect and copy any state or Federal logbook maintained voluntarily or as required by regulation.

(8) *Assistance.* Provide all other reasonable assistance to enable observer(s) to carry out their duties, including, but not limited to:

(i) Measuring decks, codends, and holding bins.

(ii) Providing the observer(s) with asafe work area.

(iii) Collecting bycatch when requested by the observer(s).

(iv) Collecting and carrying baskets offish when requested by the observer(s).

(v) Allowing the observer(s) to collect biological data and samples.

(vi) Providing adequate space for storage of biological samples.

(9) *At-sea transfers to or from processing vessels.* [Reserved]

(e) *Procurement of observers services by at-sea processing vessels.* [Reserved]

(f) *Certification of observers in the at-sea processing vessels.* [Reserved]

(g) *Certification of observer contractors for at-sea processing vessels.* [Reserved]

(h) *Suspension and decertification process for observers and observer contractors in the at-sea processing vessels.* [Reserved]

(i) *Release of observer data in the at-sea processing vessels.* [Reserved]

(j) *Sample station and operational requirements*—(1) *Observer sampling station.* This paragraph contains the requirements for observer sampling stations. The vessel owner must provide an observer sampling station that complies with this section so that the observer can carry out required duties.

(i) *Accessibility.* The observer sampling station must be available to the observer at all times.

(ii) *Location.* The observer sampling station must be located within 4 m of the location from which the observer samples unsorted catch. Unobstructed passage must be provided between the observer sampling station and the location where the observer collects sample catch.

(iii) *Minimum work space aboard at-sea processing vessels.* [Reserved]

(iv) *Table aboard at-sea processing vessels.* [Reserved]

(v) *Scale hanger aboard at-sea processing vessels.* [Reserved]

(vi) *Diverter board aboard at-sea processing vessels.* [Reserved]

(vii) *Other requirements for at-sea processing vessels.* [Reserved]

(2) *Requirements for bins used to make volumetric estimates on at-sea processing vessels.* [Reserved]

(3) *Operational requirements for at-sea processing vessels.* [Reserved]

[FR Doc. 01–10150 Filed 4–23–01; 8:45 am]

BILLING CODE 3510–22–S

Appendix P: 50 CFR Part 600 Observer Health and Safety Regulations

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

50 CFR Part 600

[Docket No. 970829214–8090–02; I.D. 082097B]

RIN 0648–AJ76

Magnuson-Stevens Fishery Conservation and Management Act Provisions; Observer Health and Safety

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Final rule.

SUMMARY: NMFS amends the regulations that pertain to fishery observers and the vessels that carry them. This regulatory amendment implements measures to ensure the adequacy and safety of fishing vessels that carry observers. Owners and operators of fishing vessels that carry observers are required to comply with guidelines, regulations, and conditions in order to ensure that their vessels are adequate and safe for the purposes of carrying an observer and allowing normal observer functions.

DATES: Effective June 17, 1998.

ADDRESSES: Copies of the Regulatory Impact Review prepared for this action may be obtained from NMFS, SF3, 1315 East-West Highway, Silver Spring, MD 20910, Attn: William J. Bellows.

FOR FURTHER INFORMATION CONTACT:
William J. Bellows, 301–713–2341.

SUPPLEMENTARY INFORMATION:

Background

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act), as amended (16 U.S.C. 1801 *et seq.*), the Marine Mammal Protection Act, as amended (MMPA; 16 U.S.C. 1361 *et seq.*), and the Atlantic Tunas Convention Act, as amended (ATCA; 16 U.S.C. 971 *et seq.*) authorize the Secretary of Commerce (Secretary) to station observers aboard commercial fishing vessels to collect scientific data required for fishery and protected species conservation and management, to monitor incidental mortality and serious injury to marine mammals and to other species listed under the Endangered Species Act (ESA), and to monitor compliance with existing Federal regulations. In addition, pursuant to the South Pacific Tuna Act of 1988 (16 U.S.C. 973 *et seq.*) observers may be required in the South Pacific Tuna Fishery.

The Magnuson-Stevens Act directs that—

...the Secretary shall promulgate regulations, after notice and opportunity for public comment, for fishing vessels that carry observers. The regulations shall include guidelines for determining—

(1) when a vessel is not required to carry an observer on board because the facilities of such vessel for the quartering of an observer, or for carrying out observer functions, are so inadequate or unsafe that the health or safety of the observer or the safe operation of the vessel would be jeopardized; and

(2) actions which vessel owners or operators may reasonably be required to take to render such facilities adequate and safe.

A proposed rule to implement the required measures was published in the **Federal Register** on September 22, 1997 (62 FR 49463), and invited public comment through October 22, 1997. Several comments were received late in the comment period requesting that the comment period be extended. NMFS extended the comment period 30 days (62 FR 55774, October 28, 1997).

Eleven letters of comment were received concerning the proposed rule. Of these 11, eight expressed opposition to the rule or to specific provisions in the rule, and one letter was signed by eight individuals who represented different industry organizations. Two letters expressed strong support for the rule, one of which was from an observer organization with approximately 200 members. One letter expressed neither opposition nor support but listed many problems that observers face on the job.

Comment 1: The publication of the rule was inadequately advertised/ announced. It was not on any of the following notice mediums: NMFS bulletin boards, NMFS press release, NMFS homepage, or Alaska Region homepage. The commenter requested an extension of the 30-day comment period.

Response: The proposed rule was published in the **Federal Register** on September 22, 1997 (62 FR 49463). The comment period was extended for 30 days and was announced by publication in the **Federal Register** on October 28, 1997 (62 FR 55774). In addition to the October 28 publication of the extension of the comment period, both the proposed rule and the extension of the comment period were posted on the NMFS homepage and on the Alaska Region homepage during the extended comment period.

Comment 2: The 30-day extension of the comment period is grossly inadequate.

Response: NMFS disagrees. By extending the public comment period by an additional 30 days, NMFS doubled the length of the original comment period. NMFS believes that a 60-day public comment period is adequate.

Comment 3: Observers are not qualified to make a judgement regarding vessel safety.

Response: It is true that observers do not receive the same vessel safety examination training that U.S. Coast Guard (USCG) personnel do. However, NMFS observers are provided training that addresses vessel safety. For example, in the North Pacific observer training, observers are taught to look for obvious areas of non-compliance that may jeopardize their safety. In addition to viewing several safety videos, the observers are shown a set of "safety tour" slides in which they are asked to look for items on a safety check list. Section 600.746(c)(3) has been added to the rule; this section encourages the observer to check major safety items (as identified by the USCG) and to briefly check the vessel's major spaces for especially hazardous conditions. The intent of this rule is not to empower an observer as a USCG enforcement official. Its purpose is to encourage an observer to check the major safety items identified in § 600.746(c)(3); if these items are absent or unserviceable, the rule empowers the observer not to sail with the vessel until those deficiencies are corrected. The observer's pre-trip safety check will be made in accordance with published USCG guidance on some of the most important items that would be required in the event of an at-sea emergency.

Comment 4: The rule's evaluation that there will be no significant impact on a substantial number of small entities is wrong. If an observer refuses to board a vessel that is safe in accordance with USCG standards, the vessel could be delayed in departing long enough to miss an important part of a short season, resulting in significant lost opportunity to fish. The observer's refusal could be the result of poor judgement, lack of expertise or training, or vindictiveness.

Response: NMFS has added language to the rule in § 600.746(c)(3) that is intended to minimize, if not eliminate, the possibility of an observer making a decision, for whatever reason, regarding a safe

vessel that would delay its beginning legal fishing at the optimum time. The above-mentioned section was added to the regulations in order to give the observer detailed guidance regarding the pre-trip safety check. In addition, this document makes it clear that the observer's safety check is to confirm that the USCG safety decal is current and to spot-check other safety items by conducting a brief walk through the vessel's major spaces to check for obviously hazardous conditions. NMFS believes that the training observers now receive is adequate to enable an observer to conduct the pre-trip safety check as discussed in the response to comment 3.

Comment 5: There are no provisions for redress and appeal in the event that a vessel is unnecessarily detained or impacted.

Response: There are no specific procedures for redress or appeal in these regulations. It would be redundant to include those legal procedures here because they are available to anyone who considers that he or she has experienced wrongful negative impact of any regulations. As is suggested in the response to comment 17, when a vessel operator disputes the observer's decision and is unable to reach a resolution, the vessel operator should call the USCG and request reexamination of the issue in dispute.

Comment 6: If the regulations were approved in the absence of USCG regulations, they would be inadequate.

Response: They are not being approved in the absence of USCG regulations. The intent of this rule is to build upon the USCG and other safety regulations. The regulations intend to insure the safety of observers at sea without duplicating USCG regulations, which are designed to insure the safety of all persons on board fishing vessels.

Comment 7: All vessels carrying observers are required to have a current safety decal; consequently, there is no basis for an observer refusing to board a vessel.

Response: If the decal is valid (current) and if no safety equipment has been lost, damaged, or is otherwise unserviceable, there should be no safety-related reasons for an observer to refuse boarding. If, on the other hand, the decal is current, but safety equipment is missing or unserviceable, the observer is authorized not to board the vessel.

Comment 8: The style of referring to other sections of the CFR is difficult to read and understand. Furthermore, some of the sections cited have not been written.

Response: This rule cites other sections of the CFR rather than duplicating those sections in order to make the regulations published in the **Federal Register** as concise as possible. NMFS wants the regulations to refer to the most recent versions of the regulations cited. If other agencies' regulations were repeated in NMFS' regulations, it would be nearly impossible for NMFS to keep the regulations current. By citing the other agencies' regulations, the reference is always to the most recently amended regulation. All cited sections have been written and published before they are incorporated into the CFR except for citations to the rule being enacted through this action. The regulatory text for this rule follows after this preamble. Some changes may have been too recent to appear in the CFR dated October 1996, which was the last-published CFR at the time that the proposed rule was published.

Comment 9: USCG no longer performs no-cost inspections of processor vessels.

Response: The commenter is correct. Processing vessels examined by private organizations comprise the only category of fishing vessels that pays to have inspections done. These for-fee inspections are in lieu of USCG dockside examinations but do not preclude at-sea examinations by USCG. The inspections of processing vessels are required whether observer safety rules are in effect or not.

Comment 10: This rulemaking is premature; "neither the industry nor NMFS is ready at this time to begin discussions on such rules. Before that discussion can begin, NMFS first needs to develop appropriate rules regarding onboard observers in all the other fisheries in which they have been deemed necessary."

Response: This rule is required by the Magnuson-Stevens Act.

Comment 11: It is unrealistically generous to require that accommodations be equivalent to those of the vessel's officers. Observers do not warrant treatment as officers.

Response: This rule requires nothing specific regarding accommodations for observers. It merely refers to regulations already in place.

Comment 12: Under the regulations that would be put in place by this rule, if all vessels were required to carry observers, all vessels would have to undergo safety inspections. This would mean the end of uninspected fishing vessels.

Response: Under the assumptions made by the commenter, it is true that if all vessels were required to carry observers, all of them would have to be examined. At the present time, however, not all vessels are required to carry observers. NMFS wants fishing vessels carrying observers to fish safely, and undergoing USCG safety examinations promotes safety.

Comment 13: What is the authority under which regional requirements governing observer accommodations might be developed? It is possible that these regional requirements could have unintended effects. For example, if the regional requirement deals with an issue that is judged subjectively, such as the adequacy of accommodations or food, the observer in applying that subjective judgement could keep a safe vessel from fishing.

Response: The authorities under which regional requirements are developed are the Magnuson-Stevens Act, the Marine Mammal Protection Act, and the ESA. The addition of § 600.746(c)(3) to the rule should eliminate the problem of subjective judgement in conducting the vessel's pre-trip safety check. It is not the intent of this rule to develop regional requirements.

Comment 14: If a vessel has a valid USCG safety decal, there should be no question concerning the vessel's safety. To then have an observer, who has the authority to refuse to board the vessel because of a safety deficiency, is double jeopardy.

Response: If a vessel has passed a USCG dock-side safety examination, the regulations indicate that such vessel would be considered safe with respect to the USCG regulations. However, it is possible that some requirements with which the vessel was in compliance at the time of the USCG safety examination may not be met at the time of boarding by an observer for a specific trip. NMFS has added language at § 600.746(c)(3) that encourages the observer to examine some of the most important items that would be required in the case of an emergency at sea. This approach is consistent with that applied by USCG in recognizing that changes in vessel safety may occur between the time when a USCG safety decal is issued and the beginning of subsequent fishing. NMFS notes that this rule gives an observer authority not to board an unsafe or inadequate vessel. If such a vessel is operating in a fishery with mandatory observer coverage, the result of the observer's refusing to board might be that the vessel would not be authorized to conduct fishing.

Comment 15: This rule cites other regulations already in place, which suggests that regulations to effect safety are already in place. That being the case, this rule will not change anything.

Response: This rule applies safety standards to all fisheries, including those for which no other observer regulations are in place. In fisheries with mandatory observer programs in place now, and for those in which mandatory programs may be established, this rule makes it a violation to fish without an observer aboard. This rule also requires vessels to submit to an otherwise voluntary inspection program to provide evidence of compliance with safety standards.

Comment 16: This rule is an attempt to exceed the authority conveyed by the Magnuson-Stevens Act in that it goes beyond USCG regulations by authorizing an observer to refuse to board an unsafe vessel, thereby keeping the vessel from fishing legally. It goes beyond what is necessary to provide a safe environment for an observer, and it gives an observer authority that Congress gave to USCG.

Response: NMFS believes that the rule does not go beyond what is required to provide a safe environment for observers and for other persons aboard fishing vessels. The intent of the rule is not to empower an observer with USCG enforcement official status; its intent is to provide a safe vessel for an assigned observer. The NMFS rule does not encroach on USCG authority to terminate a voyage. Rather, it conditions a vessel's ability to fish safely by requiring compliance with existing regulations enforced by the USCG. The authority to regulate fishing activities properly rests with NMFS.

Comment 17: If NMFS wants to require more than vessel-provided personal flotation devices (PFDs) and safety briefings, it should specifically identify the requirements that relate to observer

safety rather than to such other safety concerns as the environment. NMFS should also consider which safety requirements warrant giving observers "the extraordinary authority to prevent a vessel from undertaking a fishing trip."

Response: NMFS is not giving greater significance to some USCG regulations than to others. NMFS is encouraging observers to check for compliance with existing regulations. A safety decal is considered to be evidence of compliance, but if there is other obvious non-compliance, the observer has the option of not boarding the vessel. If the vessel operator disputes the observer's decision, which should be based upon published USCG guidance on some of the most important items that would be required in the event of an at-sea emergency, and no resolution is reached, the vessel operator should call the USCG to request reexamination of the issue in dispute. The addition of § 600.746(c)(3) clarifies which items the observer should check at the time of boarding. The observer's pre-trip safety check will be made in accordance with published Coast Guard Guidance on some of the most important items that would be required in the event of an at-sea emergency. NMFS recognizes that, in some circumstances, an observer may raise a safety question that requires a vessel to wait for a USCG boarding before fishing. It is true that this could result in a loss of fishing days. In structuring the rule this way, NMFS had to weigh the impacts of this approach versus the impacts of alternative approaches. Just as there is a potential for a vindictive observer declining to board and thereby delaying a vessel's departure, other approaches would have raised the possibility of an observer being coerced into boarding a vessel that he or she believes is unsafe. Given the safety risks at issue and the probability that most safety violations will be easily remedied, e.g., replacing PFDs, NMFS determined that placing the presumptions in the selected manner was preferable. Whenever possible, vessel owners/ operators are encouraged to arrange for the observer to make the pre-trip safety check in advance of the beginning of the planned fishing trip. In that way, there would be time to correct problems without delaying the trip's departure time.

Comment 18: There are alternatives that would accomplish NMFS' objectives that were not considered by NMFS. One alternative is to provide an automatic waiver for those situations in which an observer refused to board a vessel for safety reasons. The waiver would be valid until the vessel had undergone a USCG inspection either at sea or in port. Alternative two would be to require that the safety determination be made by a NMFS enforcement agent who had completed the USCG training program for vessel safety inspections. Alternative three would be to determine which classes of vessels have consistently failed to provide safe working conditions for observers. Only those classes of vessels would be required to comply with the rule. Vessels with proven safety records would be exempt from the provisions of this rule.

Response: Alternative one would void the intent of the rule. It would not make the vessel safe for the observer on the fishing trip that the observer was assigned to observe. Furthermore, it could provide an opportunity for vessel operators to avoid taking observers by incurring safety violations, such as no PFD for the observer. By authorizing an observer to refuse to board an unsafe vessel and by making it illegal to fish without an observer in a mandatory observer fishery, there is a strong incentive for the vessel to meet all USCG safety regulations. Alternative two was considered and rejected. It is equally possible that a NMFS enforcement agent, like an observer, would discover a safety violation that would delay a vessel's fishing trip. This option would also create the risk of an observer having to board a vessel that he or she believes is unsafe. In addition, from a practical standpoint, the current work load for NMFS enforcement agents makes it impossible for them to undertake this responsibility and continue to perform other enforcement functions/duties. Alternative three is not feasible because vessel safety is an individual vessel issue not one that can be addressed by classes of vessels.

Comment 19: The rule does not analyze measures taken by regions.

Response: It is not the intent of this rule to analyze measures taken by regions. That analysis is done at the time those measures are developed and proposed in the rulemaking process.

Comment 20: One commenter believes that, should an observer refuse to board a vessel because of safety deficiencies, there could be legal implications beyond the simple issue of the USCG safety requirement and the vessel's fishing. "After an observer has determined a vessel to be unsafe, a crew

member injures themself [sic] in the factory. Considering the Jones Act, the lawyers would have a field day."

Response: NMFS believes this comment refers to the possible use of an observer's safety determinations as evidence in a law suit. As stated in the responses to comments 3 and 16, this rule is not intended to give observers the authority to make actual determinations as to a vessel's compliance with USCG regulations. Rather, it simply requires that a vessel, if its safety has been called into question, rectify the shortcoming or submit to a new USCG safety examination or inspection. If anything, this rule is likely to reduce the number of negligence claims because vessels with questionable safety issues will correct them or be reexamined by USCG before fishing.

Comment 21: The USCG should be consulted.

Response: The USCG was involved at every stage of development of this rule.

Comment 22: One commenter raised specific issues about an observer who was terminated and who subsequently filed suit.

Response: Because the case is before the court, it would be inappropriate for NMFS to respond at this time.

Changes From the Proposed Rule

Four changes were made from the proposed rule. One was made in response to comments: A provision was added at § 600.746(c)(3) to provide guidance on the scope of the observer's pre-trip safety check.

Another change was made to clarify that USCG performs either an inspection or an examination: The words "examination or inspection" replaced "inspection" in §§ 600.725(p), 600.746(c)(1), and 600.746(d)(1) so that it is clear that either an examination or an inspection can be performed.

The word "Examination" was inserted in § 600.746(c)(1) in order to more clearly identify the Commercial Fishing Vessel Safety Examination decal.

The word "examine" replaced "inspect" in § 600.746(c)(2) in order to avoid confusion with USCG inspection.

The observer's pre-trip safety check of a vessel that displays a current Commercial Fishing Vessel Safety Examination decal will normally consist of no more than a spot check of the equipment identified in § 600.746(c)(3), i.e., PFDs/immersion suits; ring buoys; distress signals; fire extinguishing equipment; emergency position indicating radio beacon, when required; survival craft, when required; and a walk through major spaces. This walkthrough is not intended to broaden the scope of the safety check. The safety check should be done expeditiously because the decal indicates that the vessel has already undergone an extensive dockside inspection.

Classification

At the proposed rule stage, NMFS certified to the Assistant General Counsel for Legislation and Regulation, Department of Commerce and to the Chief Counsel for Advocacy, Small Business Administration that this action would not result in a significant economic impact on a substantial number of small entities. Comments received on the proposed rule suggested that small entities might experience a significant economic impact as a result of the rule. Based on this new information, NMFS decided to prepare a Final Regulatory Flexibility Analysis (FRFA). The FRFA concludes that the rule's authorization for an observer to refuse to board a vessel that the observer believes to be unsafe and the rule's requirement that a vessel required to carry an observer cannot legally fish without the observer make it possible that implementation of this rule could delay a vessel's departure for a fishing trip. Because of variations in the structures of different fisheries' mandatory observer programs and in the structures of the different fishery management regimes, the fact that an observer refused to board would not necessarily mean that the vessel would lose fishing time as might be the case in those fisheries where vessels are allowed a limited number of days fishing per year. It is not possible to estimate accurately how many, if any, vessels would lose days at

sea as a result of this rule. Therefore, there is at least a theoretical possibility that 20 percent of the affected small entities could experience a significant economic impact.

In addition to the preferred alternative, which is the alternative that is implemented by this rule, NMFS considered several other alternatives. One of them would have been to take no action. Under this approach, vessels that carry observers would be required to comply with the same safety standards that would be applicable under the preferred alternative, but there would be no guidance to interested parties as to how to conduct a pre-trip safety check nor would there be any means by which an observer could quickly ascertain whether the vessel was in compliance with applicable USCG regulations. If the agency were to adopt the no-action alternative, the Congressional mandate in the Magnuson-Stevens Act would not be effected. In addition, there would be continued risk of unsafe conditions on board vessels to which observers were assigned.

Another alternative would have prescribed new national standards for a wide range of safety and accommodations issues. Basic standards for determining a vessel's safety and adequacy would be based on USCG safety requirements and NMFS regional observer requirements as is the case in the first alternative. In addition to those basic USCG standards, this alternative would result in new regulations addressing a wide range of accommodation issues, such as quality of food, which, if not met, would authorize an observer not to board a fishing vessel. The observer would be authorized to make the pre-trip safety check to determine whether or not he/ she would board the vessel. In mandatory observer programs, a fishing vessel would not be permitted to fish legally without an observer. This alternative is not the preferred alternative because of the degree to which an observer would be authorized to make subjective, qualitative determinations. Furthermore, because of the variability of working conditions on fishing vessels, some vessels could not reasonably or economically meet the expectations of all observers. Therefore, the risk of this alternative resulting in delays of fishing trips is greater than that of the preferred alternative.

The last alternative that NMFS considered would have prescribed basic standards for determining safety and adequacy as described in the preferred alternative, but either the National Marine Fisheries Service or an authorized observer contractor would have been authorized to make the pretrip safety check to determine whether or not the observer would board the vessel. In mandatory observer programs, a fishing vessel would not be permitted to fish legally without an observer. This alternative would have used the same evaluation criteria (USCG dockside safety examination, pre-trip safety check, presence of a current Commercial Fishing Vessel Safety Decal, etc.) as the preferred alternative but would give NMFS and/or an authorized observer contractor the authority to decide whether a vessel is safe and adequate. The rationale for this approach is that it would avoid putting the observer into a situation where vessel owner, operator, and crew might exert pressure to coerce the observer to declare the vessel safe despite conditions that the observer believed to be unsafe. It would also avoid the potential for a "vindictive" observer to abuse discretion in making safety checks. The benefit of having NMFS or an authorized observer contractor make the safety and adequacy decision is that it would avoid putting the additional pressure on an observer of potentially having to tell a captain and crew with whom he/she would be spending time at sea that a fishing trip would be delayed. However, this alternative would also have the potential to delay a fishing voyage pending safety resolution. It is just as possible that a NMFS employee or observer contractor would discover safety issues in need of attention as an observer would. In addition, under this alternative, an observer who believes a vessel to be unsafe may be instructed to board because NMFS or the observer contractor believes the vessel to be safe. There would also be costs to NMFS and/ or the observer contractor in the form of having a representative on site each time an observer boarded a vessel. NMFS and/or the observer contractor would also experience the cost of training employees to make the pre-trip safety check. This alternative is not preferred because it would put a third party in a position of judging a vessel's safety and perhaps of forcing an observer aboard an unsafe vessel.

In addition to these alternatives, one commenter suggested two additional alternatives: The first would have provided an automatic waiver for those situations in which an observer refused to board a vessel for safety reasons. The waiver would be valid until the vessel had undergone a USCG inspection either at sea or in port. This alternative would have voided the intent of the rule. It would not make the vessel safe for the observer on the fishing trip that the observer was assigned to observe. Furthermore, it could provide an opportunity for vessel operators to avoid taking observers by incurring safety violations, such as no PFD for the observer. The other suggested alternative would be to determine which classes of vessels have consistently failed to provide safe working conditions for observers. Only those classes of vessels would be required to comply with the rule. Vessels with proven safety records would be exempt from the provisions of this rule. This approach is not feasible because vessel safety is an individual vessel issue not one that can be addressed by classes of vessels.

NMFS tried to mitigate the potential impact of the rule by using objective standards for the observer's pre-trip safety check in the form of the published USCG guidance about the most important items that would be required in the event of an at-sea emergency. This particular alternative was chosen because it seemed to be an appropriate balance between the objectives of increasing observer safety and minimizing the risk of negative economic impact on vessels.

This action has been determined to be not significant for purposes of E.O. 12866.

List of Subjects in 50 CFR Part 600

Administrative practice and procedure, Confidential business information, Fisheries, Fishing, Fishing vessels, Foreign relations, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Statistics.

Dated: May 12, 1998.

David L. Evans,

Deputy Assistant Administrator for Fisheries, National Marine Fisheries Service.

For the reasons set forth in the preamble, 50 CFR part 600 is amended as follows:

PART 600—MAGNUSON-STEVENS ACT PROVISIONS

1. The authority citation for 50 CFR part 600 continues to read as follows:

Authority: 5 U.S.C. 561 and 16 U.S.C. 1801 *et seq.*

2. Section 600.725 is amended by redesignating paragraph (p) as paragraph (t), adding paragraphs (p), (q), (r), (s), and (u), and revising newly redesignated paragraph (t) to read as follows:

§ 600.725 General prohibitions.

* * * * *

(p) Fail to submit to a USCG safety examination when required by NMFS pursuant to § 600.746.

(q) Fail to display a Commercial Fishing Vessel Safety Examination decal or a valid certificate of compliance or inspection pursuant to § 600.746.

(r) Fail to provide to an observer, a NMFS employee, or a designated observer provider information that has been requested pursuant to § 600.746, or fail to allow an observer, a NMFS employee, or a designated observer provider to inspect any item described at § 600.746.

(s) Fish without an observer when the vessel is required to carry an observer.

(t) Assault, oppose, impede,intimidate, or interfere with a NMFS-approved observer aboard a vessel.

(u) Prohibit or bar by comm. And ,impediment, threat, coercion, or refusal of reasonable assistance, an observer from conducting his or her duties aboard a vessel.

3. In subpart H, §600.746 is added to read as follows:

§ 600.746 Observers.

(a) *Applicability*. This section applies to any fishing vessel required to carry an observer as part of a mandatory observer program or carrying an observer as part of a voluntary observer program under the Magnuson-Stevens Act, MMPA (16
U.S.C. 1361 *et seq*.), the ATCA (16
U.S.C. 971 *et seq*.), the South Pacific Tuna Act of 1988 (16 U.S.C. 973 *et seq*.), or any other U.S. law.

(b) *Observer requirement*. An observer is not required to board, or stay aboard, a vessel that is unsafe or inadequate as described in paragraph (c) of this section.

(c) *Inadequate or unsafe vessels*. (1) A vessel is inadequate or unsafe for purposes of carrying an observer and allowing operation of normal observer functions if it does not comply with the applicable regulations regarding observer accommodations (see 50 CFR parts 229, 285, 300, 600, 622, 648, 660, 678, and 679) or if it has not passed a USCG safety examination or inspection. A vessel that has passed a USCG safety examination or inspection must display one of the following:

(i) A current Commercial FishingVessel Safety Examination decal, issued within the last 2 years, that certifies compliance with regulations found in 33 CFR, chapter I and 46 CFR, chapter I;

(ii) A certificate of compliance issuedpursuant to 46 CFR 28.710; or

(iii) A valid certificate of inspectionpursuant to 46 U.S.C. 3311.

(2) Upon request by an observer, aNMFS employee, or a designated observer provider, a vessel owner/ operator must provide correct information concerning any item relating to any safety or accommodation requirement prescribed by law or regulation. A vessel owner or operator must also allow an observer, a NMFS employee, or a designated observer provider to visually examine any such item.

(3) *Pre-trip safety check*. Prior to each observed trip, the observer is encouraged to briefly walk through the vessel's major spaces to ensure that no obviously hazardous conditions exist. In addition, the observer is encouraged to spot check the following major items for compliance with applicable USCG regulations:

(i) Personal flotation devices/immersion suits;

(ii) Ring buoys;

(iii) Distress signals;

(iv) Fire extinguishing equipment;

(v) Emergency position indicatingradio beacon (EPIRB), when required; and

(vi) Survival craft, when required.

(d) *Corrective measures*. If a vessel is inadequate or unsafe for purposes of carrying an observer and allowing operation of normal observer functions,

NMFS may require the vessel owner or operator either to:

(1) Submit to and pass a USCG safetyexamination or inspection; or

(2) Correct the deficiency that isrendering the vessel inadequate or unsafe (e.g., if the vessel is missing one personal flotation device, the owner or operator could be required to obtain an additional one), before the vessel is boarded by the observer.

(e) *Timing*. The requirements of this section apply both at the time of the observer's boarding, at all times the observer is aboard, and at the time the observer is disembarking from the vessel.

(f) *Effect of inadequate or unsafe status*. A vessel that would otherwise be required to carry an observer, but is inadequate or unsafe for purposes of carrying an observer and for allowing operation of normal observer functions, is prohibited from fishing without observer coverage.

[FR Doc. 98–13131 Filed 5–15–98; 8:45 am]
BILLING CODE 3510–22–F

Appendix Q: Vessel Selection in 2004

Limited Entry Groundfish Trawlers:

- Selection based on 2-Month Cumulative Trip Limit periods.
- All trips taken during selected 2-months are covered by an Observer.
- Between May 1, 2004 and December 31, 2004, all Groundfish Trawlers will be selected.

Limited Entry Fixed Gear – Sablefish Endorsed

- Selection based on sablefish tier quota(s).
- Sablefish season is April 1 – October 31.
- All trips that land fish on the sablefish tier quota are covered by an Observer.
- Approximately ¼ of total sablefish endorsed permits will be covered during 2004 season.

Limited Entry Fixed Gear – Nonsablefish Endorsed

- Selection based on 2-Month Cumulative Trip Limit periods.
- All trips taken during selected 2-months are covered by an Observer.
- Approximately ½ of Nonsablefish Endorsed vessels will be covered in 2004.

Open Access – California

- Selection based on 2-Month Cumulative Trip Limit periods
- All trips taken during selected 2-months may be covered by an Observer.
- Open access vessels will be selected once between January 1, 2004 and June 30, 2004 and once between July 1, 2004 and December 31, 2004.

Open Access – Oregon and Washington

- At time of printing, Oregon and Washington legislation had not yet passed to allow the coverage of open access vessels.

Appendix R: Radio Communications

The radios that you will encounter most often are VHF-FM (Very High Frequency Modulation), used for short-range vessel-to-vessel and vessel-to-shore communication, and HF-SSB (High Frequency-Single Side Band), used for communication when the stations are out of VHF range with each other. Both types offer certain special advantages, and each requires a specific operating procedure. The use of radio communication equipment requires a licensed operator. If your vessel has given you permission to use the radio, you must follow the FCC rules for calling and speaking on the type of radio (VHF or SSB) you use. Ask first how to operate the radio and use these pages as a guide for calling. Be aware that obstructing others' transmissions with your call (by conversing for too long), using profanities or making false distress calls can cost the permit holder and/or you a heavy fine and/or prison sentence.

VHF-FM Radios

In the United States, the VHF Band is broken up into 71 channels, with a frequency range of from 156.000 to 163.000 MHz, including six WX (Weather) channels. By law, all operating VHF stations are required to have at least three of these channels: channel 6, channel 16, and at least one other working channel.

Channel 6 (156.300 MHz) is the Intership Safety Channel, used for intership safety purposes, search-and rescue (SAR) communications with ships and aircraft of the U.S. Coast Guard, and vessel movement reporting within ports and inland waterways. This channel must not be used for non-safety communications.

Channel 16 (156.800 MHz) is the International Distress, Safety, and Calling Channel (Intership and Shipto-Coast). This channel must be monitored at all times the station is in operation (except when actually communicating on another channel). This channel is also monitored by the U.S. Coast Guard, Public Coastal Stations, and many Limited Coastal Stations. Calls to vessels are normally initiated on this channel. Then, except in an emergency, you must switch to a working channel. It is against FCC regulations to conduct business on this channel. In addition, vessels calling must use their assigned call sign at the beginning and end of each transmission.

Channel 22A (157.100 MHz) is the U.S. Coast Guard Liaison Channel. This channel is used for communications with U.S. Coast Guard ships, aircraft, and coastal stations after first establishing contact on channel 16. Navigational warnings and, where not available on WX channels, Marine Weather forecasts are also broadcast on this frequency.

Channels 24. 25. 26. 27 and 28 (also 84. 85. 86 and 87) are the Public Correspondence channels (ship-to-coast). These are available to all vessels to communicate with Public Coastal stations (Marine Operator).

Channels 26 and 28 are the primary public correspondence channels.

Channels 1. 3. 5. 12. 13. 14. 15. 17. 65. 66. 73. 74. 77. 81. 82 and 83 are channels with special designations (port traffic communications, U.S. government communications, locks and bridges, environmental, etc.), and their use close to shore or to ports should be minimized..

Channels 7. 8. 9. 10. 11. 18. 19. 67. 68. 69. 70. 71. 72. 78. 79. 80 and 88 are commercial and non-commercial working channels that are available for conducting business. The abbreviated format (no call signs) is acceptable on these frequencies. It should be noted that some of these channels may be locally restricted (off the Washington Coast, for example, channel 11 is Tofino Coast Guard Traffic Control for the entry into Juan deFuca Strait, used for reporting ship locations), in which case their use for business should be avoided.

HF-SSB Radios

To communicate over distances of beyond twenty miles, you will need to use satellite communication or a medium to high frequency radiotelephone referred to as Single Side Band (SSB) radio. The signal is poorer in quality than VHF and susceptible to slight atmospheric shifts. Lower frequencies are used for medium distances and higher frequencies for greater distances. The general rule for single sideband frequency selection is: multiply the frequency in MHz by 100 to obtain the approximate coverage distance in miles. At night however, the ranges of SSB radio wave travel are from 2-3 times greater. Therefore, use a lower frequency at night to cover the same distance.

All ship SSB radiotelephones must be capable of operating on 2182 kHz, the international distress and calling frequency, and at least 2 other frequencies. Numerous channels are available for your use; which ones are available varies from place to place. However, channel 2670 kHz is only used for communicating with the Coast Guard and should not be used for other purposes.

When using SSB radiotelephone, you must observe radio silence on channel 2182 kHz, the emergency channel, for 3 minutes immediately after the hour and the half hour. The purpose of radio silence on the emergency hailing channel is to clear the airwave for weak or distant distress signals. No radio silence is used on the VHF emergency channel: channel 16.

Radio Procedure

In as much as the airwaves are in the public domain, it is the responsibility of the radio station operator to conduct business according to established guidelines and procedures. While on the air, the operator should follow the following format outline:

1) Listen before beginning transmission in order to ensure that you are not interfering with other stations or with emergency radio traffic.
2) Identify your station when calling. On the SSB, a calling station must limit the duration of the hail to not more than 30 seconds. If there is no reply, the hail may be repeated at 2 minute intervals up to a maximum of three times, at which time the calling station must sign off and wait a minimum of 15 minutes before making another attempt. This requirement does not apply in emergency situations.
3) Keep transmissions short and concise, giving the other station a chance to respond, ask questions, or reconfirm an unclear message. A long, complicated message can best be effected in short segments with breaks in between to ensure that the receiving station has copied each portion of the message correctly.
4) Follow correct radio procedure while on the air. The phonetic alphabet should be learned and used spelling unclear words with an extemporaneous phonetic alphabet can lead to misunderstood messages. You should also know and use the radio "punctuation" words ("over", clear", "out", "roger", "words twice", "say again", "standing by", and "break").

Since most radio communication is only one way at a time, these words can be invaluable for signaling your intentions to the receiving station. Make sure to speak directly into the microphone; speaking loudly, slowly, and distinctly—but not shouting—can significantly improve the legibility of radio broadcasts. The use of profanity on the public airwaves is strictly forbidden.

5) Upon completing a transmission, you must sign off by identifying your station and using the words "clear" or "out" (or, if you expect to soon resume contact with the same station, by using the phrase "standing by").

Radios are different from telephones in that they cannot transmit and receive simultaneously. Therefore when you have temporarily finished talking and are ready to listen, say "over," and release the button on your microphone. When the other party is ready to listen they will say "over." At the end of your entire message, say "out" rather than "over." Keep in mind that people on other ships can overhear your conversation, so watch what you say.

Sounds are easily garbled on marine radios so the phonetic alphabet is used when sailors want to spell something. Here are the words that the Coast Guard will recognize as letters:

A – alpha	I - indigo	Q - quebec	Y- yankee
B - bravo	J - juliet	R - romeo	Z - zulu
C - charlie	K - kilo (keeloes)	S - sierra	
D - delta	L - lima (Leema)	T - tango	
E - echo	M - mike	U - uniform	
F - foxtrot	N - november	V - victor	
G - gulf	O - oscar	W - whiskey	
H - hotel	P - papa	X - x-ray	

Every ship and all Coast Guard stations continually listen to the emergency frequencies. Therefore when you want to talk to someone, call on an emergency frequency. As soon as you contact them, arrange to switch to another channel. It is illegal, impolite, unfair, and dangerous to talk on emergency channels. Sometimes atmospheric conditions are such that the emergency frequencies are the only ones that work. At those times you simply cannot communicate via radio except to report emergencies.

Emergency frequencies are:

- FM Channel 16, international distress
- FM Channel 13, for ships to use to avoid collisions. You can contact other ships on 13, but not Coast Guard shore stations.
- AM 2182, international distress (Almost certainly as an observer you will only be using FM frequencies.)
- When you initially contact another station make sure you state what channel you are broadcasting on, since all ships and stations constantly listen to several.
- Speak in normal tones, using normal conversational pauses and emphasis.
- Ensure that your messages are brief and businesslike. No chatter.

- When trying to establish communications repeat the other station's name, and your name, at least twice. A typical message may be as follows:

You: Coast Guard Station San Francisco Coast Guard Station San Francisco; this is the fishing vessel Starry Flounder, Whiskey Tango Zulu four, one, nine, zero; this is the fishing vessel Starry Flounder,
Whiskey Tango Zulu four, one, nine, zero on channel sixteen, over.
C.G.*: Fishing vessel Starry Flounder this is Coast Guard Station San Francisco shift and answer on channel eleven, out.*
You: Coast Guard Station San Francisco Coast Guard Station San Francisco this is the Starry Flounder on channel eleven, over.
C.G.*: Fishing vessel Starry Flounder, this is Coast Guard Station Kodiak send your traffic, over.*
You: San Francisco this is the Starry Flounder, I am an observer talking for the captain. A crewman has a
badly crushed arm and needs hospitalization. Can you evacuate the crewman? Over. "
C.G.: *Vessel Starry Flounder, this is* San Francisco. *Affirmative. What is your current position? Over. "*
You: San Francisco this is the Starry Flounder. Position is fifty-five degrees fifty minutes north, 157 degrees, twenty-four minutes west, over..A-55

Appendix S: Material Safety Data Sheet for DMSO

MATERIAL SAFETY DATA SHEET

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATHESON TRI-GAS, INC.
959 ROUTE 46 EAST
PARSIPPANY, NEW JERSEY 07054-0624

EMERGENCY CONTACT:
CHEMTREC 1-800-424-9300
INFORMATION CONTACT:
973-257-1100

SUBSTANCE: DIMETHYL SULFOXIDE

TRADE NAMES/SYNONYMS:
SULFINYLBIS(METHANE); METHYL SULFOXIDE; DMSO; DEMESO; DEMASORB; DIMETHYL SULPHOXIDE; DELTAN; DEMAVET; DMS-70; DMS-90; DOLICUR; DOLIGUR; DOMOSO; DROMISOL; HYADUR; INFILTRINA; RIMSO-50; RIMSO-100; C2H6OS; MAT07770; RTECS PV6210000

CHEMICAL FAMILY: sulfoxides

CREATION DATE: Jan 24 1989
REVISION DATE: Mar 19 2003

SECTION 2 COMPOSITION, INFORMATION ON INGREDIENTS

COMPONENT: DIMETHYL SULFOXIDE
CAS NUMBER: 67-68-5
PERCENTAGE: 100.0

SECTION 3 HAZARDS IDENTIFICATION

NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=2 REACTIVITY=0
EMERGENCY OVERVIEW:
CHANGE IN APPEARANCE: hygroscopic
COLOR: colorless
PHYSICAL FORM: liquid
ODOR: garlic odor
MAJOR HEALTH HAZARDS: harmful if inhaled, respiratory tract irritation, skin irritation, eye irritation
PHYSICAL HAZARDS: Combustible liquid and vapor.

POTENTIAL HEALTH EFFECTS:
INHALATION:
SHORT TERM EXPOSURE: irritation, nausea, vomiting, headache, dizziness
LONG TERM EXPOSURE: liver damage

SKIN CONTACT:
SHORT TERM EXPOSURE: irritation, allergic reactions, blisters, rash, itching, nausea, vomiting, diarrhea, chest pain, headache, drowsiness, blood disorders

LONG TERM EXPOSURE: same as effects reported in short term exposure
EYE CONTACT:
SHORT TERM EXPOSURE: irritation, blurred vision
LONG TERM EXPOSURE: same as effects reported in short term exposure
INGESTION:
SHORT TERM EXPOSURE: nausea, vomiting, diarrhea, stomach pain, drowsiness
LONG TERM EXPOSURE: no information on significant adverse effects

SECTION 4 FIRST AID MEASURES

INHALATION: If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.

SKIN CONTACT: Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

EYE CONTACT: Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

INGESTION: Contact local poison control center or physician immediately. Never make an unconscious person vomit or drink fluids. When vomiting occurs, keep head lower than hips to help prevent aspiration. If person is unconscious, turn head to side. Get medical attention immediately.

NOTE TO PHYSICIAN: For ingestion, consider gastric lavage and activated charcoal slurry. Consider oxygen.

SECTION 5 FIRE FIGHTING MEASURES

FIRE AND EXPLOSION HAZARDS: Moderate fire hazard. Vapor/air mixtures are explosive above flash point. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back.

EXTINGUISHING MEDIA: regular dry chemical, carbon dioxide, water, regular foam, alcohol resistant foam

Large fires: Use regular foam or flood with fine water spray.

FIRE FIGHTING: Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck: Evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas.

FLASH POINT: 192 F (89 C) (CC)
LOWER FLAMMABLE LIMIT: 2.6%
UPPER FLAMMABLE LIMIT: 42%
AUTOIGNITION: 419 F (215 C)

FLAMMABILITY CLASS (OSHA): IIIA

SECTION 6 ACCIDENTAL RELEASE MEASURES

OCCUPATIONAL RELEASE:
Avoid heat, flames, sparks and other sources of ignition. Stop leak if possible without personal risk. Reduce vapors with water spray. Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition. Keep unnecessary people away, isolate hazard area and deny entry.

SECTION 7 HANDLING AND STORAGE

STORAGE: Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.106. Keep separated from incompatible substances.

SECTION 8 EXPOSURE CONTROLS, PERSONAL PROTECTION

EXPOSURE LIMITS:
DIMETHYL SULFOXIDE:
No occupational exposure limits established.

VENTILATION: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

EYE PROTECTION: Wear splash resistant safety goggles. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

CLOTHING: Wear appropriate chemical resistant clothing.

GLOVES: Wear appropriate chemical resistant gloves.

RESPIRATOR: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. Respiratory protection is ranked in order from minimum to maximum. Consider warning properties before use.
Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode.
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or

other positive-pressure mode.
For Unknown Concentrations or Immediately Dangerous to Life or Health
Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Any self-contained breathing apparatus with a full facepiece.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: liquid
APPEARANCE: clear
COLOR: colorless

CHANGE IN APPEARANCE: hygroscopic
ODOR: garlic odor
TASTE: bitter taste
MOLECULAR WEIGHT: 78.13
MOLECULAR FORMULA: C2-H6-O-S
BOILING POINT: Not available
FREEZING POINT: 64 F (18 C)
DECOMPOSITION POINT: 372 F (189 C)
VAPOR PRESSURE: 0.37 mmHg @ 20 C
VAPOR DENSITY (air=1): 2.7
SPECIFIC GRAVITY (water=1): 1.1014
WATER SOLUBILITY: miscible
PH: Not available
VOLATILITY: Not available
ODOR THRESHOLD: Not available
EVAPORATION RATE: 4.3 (carbon tetrachloride=1)
VISCOSITY: 1.1 cP @ 27 C
COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available
SOLVENT SOLUBILITY:
Soluble: alcohol, ether, acetone, benzene, chloroform

SECTION 10 STABILITY AND REACTIVITY

REACTIVITY: Stable at normal temperatures and pressure.

CONDITIONS TO AVOID: Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Keep out of water supplies and sewers.

INCOMPATIBILITIES: combustible materials, acids, metals, oxidizing materials, halogens, metal salts, reducing agents

HAZARDOUS DECOMPOSITION:
Thermal decomposition products: aldehydes, various organic fragments, oxides of sulfur

POLYMERIZATION: Will not polymerize.

SECTION 11 TOXICOLOGICAL INFORMATION

DIMETHYL SULFOXIDE: IRRITATION DATA:
10 mg/24 hour(s) open skin-rabbit mild; 500 mg/24 hour(s) skin-rabbit mild; 100 mg eyes-rabbit; 500 mg/24 hour(s) eyes-rabbit mild
TOXICITY DATA:
1600 mg/m3/4 hour(s) inhalation-rat LC50; >11 gm/kg skin-dog LD50; 14500 mg/kg oral-rat LD50
LOCAL EFFECTS:
Irritant: inhalation, skin, eye
ACUTE TOXICITY LEVEL:
Toxic: inhalation
Slightly Toxic: ingestion
Relatively Non-toxic: dermal absorption
TUMORIGENIC DATA: Available.

MUTAGENIC DATA: Available.
REPRODUCTIVE EFFECTS DATA: Available.
ADDITIONAL DATA: Interactions with drugs may occur.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY DATA:
FISH TOXICITY: 400 ug/L 96 hour(s) LC50 (Mortality) Zebra danio, zebrafish (Brachydanio rerio)

INVERTEBRATE TOXICITY: 96400 ug/L 48 hour(s) LC50 (Mortality) Water flea (Daphnia magna)

ALGAL TOXICITY: 1.3 ug/L 72 hour(s) EC50 (Population Growth) Green algae (Selenastrum capricornutum)

PHYTOTOXICITY: 20000 ug/L 10 hour(s) (Growth) Duckweed (Lemna perpusilla)

OTHER TOXICITY: 1.65 ug/L 96 hour(s) LC50 (Mortality) Frog (Rana temporaria)

FATE AND TRANSPORT:
BIOCONCENTRATION: 1600 ug/L 4 hour(s) BCF (Residue) Guppy (Poecilia reticulata) 1.28 ug/L

SECTION 13 DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable regulations.

SECTION 14 TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:
PROPER SHIPPING NAME: Combustible liquid, n.o.s. (dimethyl sulfoxide)
ID NUMBER: NA1993

HAZARD CLASS OR DIVISION: Combustible liquid
PACKING GROUP: III

CANADIAN TRANSPORTATION OF DANGEROUS GOODS: No classification assigned.

SECTION 15 REGULATORY INFORMATION

U.S. REGULATIONS:
CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4): Not regulated.

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30): Not regulated.

SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40): Not regulated.

SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):
ACUTE: Yes
CHRONIC: No

FIRE: Yes
REACTIVE: No
SUDDEN RELEASE: No

SARA TITLE III SECTION 313 (40 CFR 372.65): Not regulated.

OSHA PROCESS SAFETY (29CFR1910.119): Not regulated.

STATE REGULATIONS:
California Proposition 65: Not regulated.

CANADIAN REGULATIONS:
WHMIS CLASSIFICATION: Not determined.

NATIONAL INVENTORY STATUS:
U.S. INVENTORY (TSCA): Listed on inventory.

TSCA 12(b) EXPORT NOTIFICATION: Not listed.

CANADA INVENTORY (DSL/NDSL): Not determined.

SECTION 16 OTHER INFORMATION

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Appendix T: Chattilon Flatbed Scale Care and Maintenance

Although useful, the Chattilon scale will only perform if you properly lubricate and maintain it.

Before You Use the Scale
Prior to taking the scale from training, you should familiarize yourself with how to use it. Additionally, you will need to ensure the scale is properly lubricated and tested. Record the serial number and the test results in your logbook.

Lubricating the Scale.
The bars on the bottom of the scale form an "X" shape. The platform floats on the tips of this "X," and there is a flex point where the bars cross. Each of these five points must be liberally lubricated. Generally, the flex points will be lubricated with a thick grease prior to issue. However, if this grease washes off during your deployment, ask the boat's engineer for thick engine grease to lubricate these points. The two bars on the front of the scale, on which the weights slide, also need to be lubricated. You may use a
WD-40 type oil, or the food grade lubricant oil issued as part of your normal observer gear. **Check all lubrication points often**. The weight bars should be oiled daily, and the points on the "X" bars beneath the platform need to be re-greased at least every few days.

Using the Scale
Whenever you are not using the scale, lock the platform in place using the black lever on the right side of the scale. Turn the lever forward to unlock the platform, and back to re-lock the platform.

Checking the Scale for Accuracy and Recalibrating.
Weigh an object on the platform scale prior to using it at sea. Record the weight of this object, and use it periodically to check your scale. If the scale no longer reads the correct weight, you will need to recalibrate the scale. The small, rectangular bar on the upper left of the weight bar has a screw head on the far left hand side, with a nut on the other end. Inside this rectangular bar is a small weight that will move when you turn the screw head. The nut on the other end will also move; this is normal. Put an object of a known weight on the scale and place the weights on the weight bar to show the known weight. If the scale is unbalanced where the known weight appears too light, turn the screw to the left until the scale balances on the correct weight. If the scale is unbalanced where the known weight appears too heavy, turn the screw to the right until the scale balances on the correct weight.

Returning the Scale
Prior to bringing the scale back to NMFS, rinse it with fresh water and let it dry. Remove any rust on the five pivot points on the bottom of the scale, and on the sliding weight bars. Lubricate the scale and transport it to NMFS with the platform in the locked position. Test the scale and record the results in your logbook. If the scale does not test out within the approved NMFS accuracy range, please alert your debriefer when you return for your final debriefing.

Appendix U: Flatfish Species Description Form

SPECIES COMMON NAME: _____

DATE: _____

HAUL NUMBER: _____

FORK LENGTH: _____

A SPECIMEN COLLECTED? Yes No

THE FISH HAS (CIRCLE ONE) - eyes on the right side eyes on the left side

ARE EITHER OF THE PELVIC FINS DIRECTLY ON THE VENTRAL RIDGE?

Yes No

ACCESSORY DORSAL BRANCH (ADB) OF THE LATERAL LINE PRESENT?

Yes No

RELATIVE TO THE THE STANDARD LENGTH, THE ADB LENGTH IS

less than half greater than half

CAN THE EYE BE SEEN FROM THE BLIND SIDE (TOP EYE SOCKET IS EMBEDDED IN THE DORSAL RIDGE)?

Yes No

WHAT IS THE BLIND SIDE COLOR? _____

RELATIVE TO THE LOWER EYE, THE MAXILLARY ENDS

_____ forward of orbit _____below mid-eye

_____ below anterior part of orbit _____ below posterior part of orbit

_____ beyond the orbit

THE PREOPERCULUM SHAPE IS -

rounded angled

ANAL SPINE PRESENT YES NO

THE SHAPE OF THE LATERAL LINE OVER THE PECTORAL FIN IS –

_____ flat **_____ curved slightly**

_____ arched **_____ highly arched**

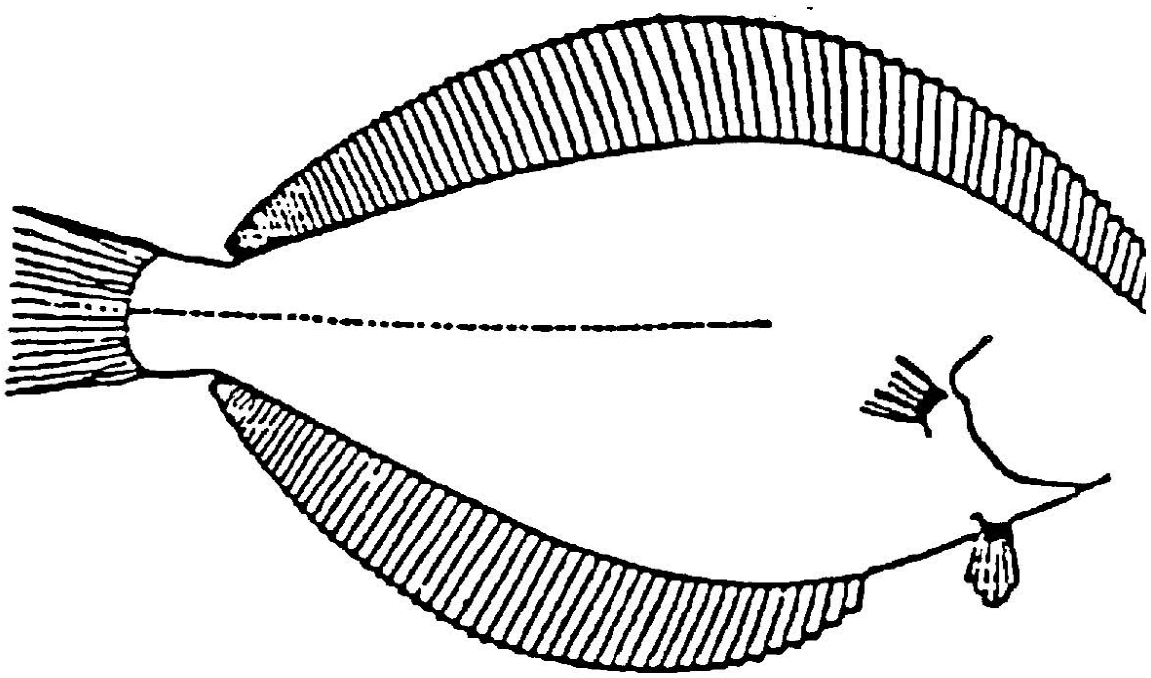
IF THE FLATFISH IS A - BERING FLOUNDER, FLATHEAD SOLE, NORTHERN OR SOUTHERN ROCK SOLE, ARROWTOOTH OR KAMCHATKA FLOUNDER, OR A SANDDAB, THEN MAKE THE FOLLOWING GILL RAKER COUNTS:

GILL RAKERS ON THE 1ST ARCH:
Total: ____
Upper arm: ____
Lower arm: ____

GILL RAKERS ON THE 2ND ARCH:
Upper arm: ____

In the diagram below, draw in the characters of your fish. DRAW:

1. the mouth, showing the size
2. preoperculum and tail shape
3. lateral line curve
4. ADB size
5. any markings



Appendix V: Rockfish Species Description Form

SPECIES COMMON NAME:_____

DATE:_____

HAUL NUMBER:_____

FORK LENGTH:_____

A SPECIMEN COLLECTED? Yes No

WHAT COLOR CATEGORY IS THIS ROCKFISH (circle one)?

Red
Red/black
Black
Banded
White-spotted red

DOES THIS FISH HAVE A SYMPHYSEAL KNOB?

___None ____Yes, small and rounded ____Yes, long and prominent

DARK BLOTCHES ON THE BODY? - *Draw these (on back of form)*

____ None
____ Yes, above lateral line only
____ Yes, bars extending below the lateral line
____ Yes, dispersed all over body

OPERCULUM MARKINGS? - *Draw these markings (on back of form)*

____ None
____ Bars radiating from the eye
____ Diffuse opercular blotch or smudge
____ Very distinct opercular blotch

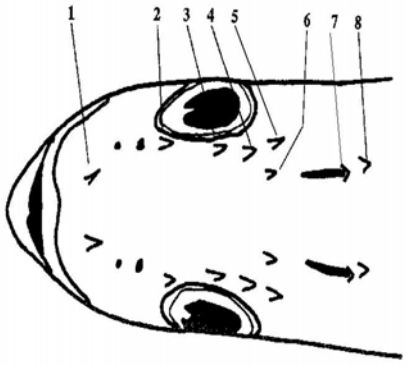
PERITONEUM COLOR = _____

HEAD SPINES ARE (circle one) -

weak strong

HEAD SPINES PRESENT (circle those found) -

1 2 3 4 5 6 7 8



ANAL FIN SLANT, AS COMPARED TO THE BODY AXIS

___ Perpendicular **___ Anterior slant (angle is toward the head)**

___ Posterior slant (angle is toward the tail) **___ Rounded anteriorly**

ANAL FIN SPINES -Compare the second anal spine length to the third anal spine

____Equal in length

____Second anal spine longer than third

____Second anal spine shorter than third

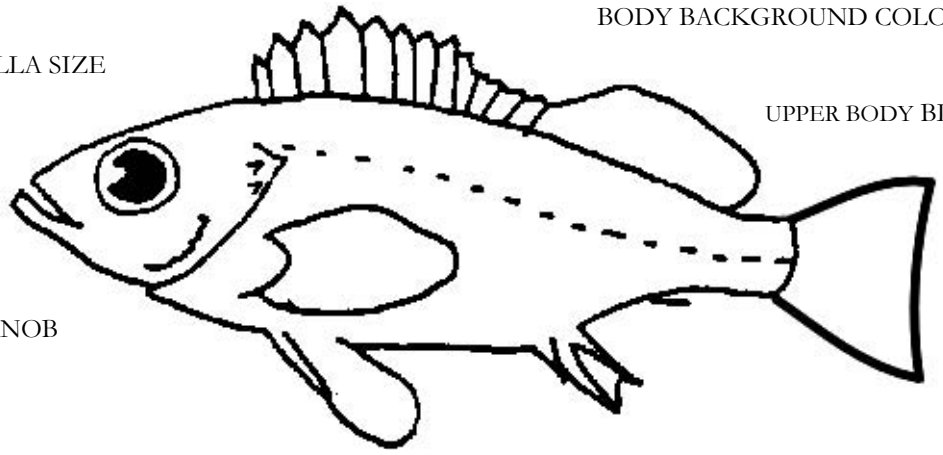
NUMBER OF SPINES UNDER THE EYE - 0 1-2 >2

DRAW THE FISH CHARACTERISTICS ON THIS DIAGRAM

BODY BACKGROUND COLOR = _____

MAXILLA SIZE

UPPER BODY BLOTCHES/ SPOTS



SYMPHESEAL KNOB

VENTRAL COLOR = _____

ANAL FIN SLANT

NOTE: IF A KEY CHARACTERISTIC THAT DISTINGUISHES ONE SIMILAR ROCKFISH FROM ANOTHER IS GILL RAKER COUNT OR FIN RAY COUNT, THEN YOU MUST MAKE THOSE COUNTS AND RECORD HERE.

FIN RAY COUNTS

Which fin was counted? - _____
What was the count? - _____

GILL RAKER COUNT

Number of total rakers - _____

Appendix W: Miscellaneous Species Description Form

SPECIES COMMON NAME:_____

DATE:_____

HAUL NUMBER:_____

FISH LENGTH:_____

A SPECIMEN COLLECTED? Yes No

CRAB - HOW MANY PAIRS OF WALKING LEGS DOES THE CRAB HAVE?

_____ Three

_____ Four

HOW MANY DORSAL FINS DOES THE FISH HAVE?

_____ One

_____ One dorsal and an adipose fin

_____ Two

_____Three

PELVIC FINS ARE - present absent modified into a sucker disc

CAUDAL FIN DESCRIPTION -

_____ A caudal peduncle and a regular tail

_____ Caudal fin meets the anal fin and there is no caudal peduncle (an eel-like tail)

CHECK OFF THE SPECIAL FEATURES OF YOUR FISH SPECIMEN

_____ Photophores
_____ Adhesive disc on bottom
_____ Large white pores on head
_____ Multiple lateral lines
_____ No lateral line
_____ Scaleless
_____ Spines on head
_____ Red dorsal fin
_____ Pelvic axillary process on pelvic fin
_____ Scutes on bottom
_____ Barbel present
_____ Body encased in bony plates
_____ Blue eyes

Describe the color and markings of the fish, or the characters of the crab you have keyed here.

Draw your fish or crab here. Indicate on the drawing the mouth size, body shape, fin locations, color and markings, and any specific characters that helped in keying the specimen.

Please do not copy the drawing from the identification manual! If your identification is incorrect, your drawing could help NMFS staff determine the correct identification.

Appendix X: Contact Addresses and Numbers

West Coast Groundfish Observer Program
Northwest Fisheries Science Center (NWFSC)
2725 Montlake Boulevard East
Seattle, WA 98112
nwfsc.observerprogram@noaa.gov

To reach any of the NMFS Coordinators, call Toll-free 1-866-780-8064

NMFS Coordinators

Washington
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NWFSC
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Seattle, WA 98112
(206) 860-3293 Office
(206) 499-9571 Cell
(206) 860-6792 Fax
Janell.Majewski@noaa.gov

Oregon
Allen Cramer
Hatfield Marine Science Center
2032 SE OSU Dr.
Newport, OR 97365
(541) 867-0527 Office
(503) 791-2703 Cell
(541) 867-0505 Fax
Allen.Cramer@noaa.gov

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John.Lafargue@noaa.gov

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Kate.Guthrie@noaa.gov

PSMFC State Liaisons

Carol Henry
Washington Fish and Wildlife
(360) 249-4628

Steve Kupillas
Oregon Department of Fish and Wildlife
(541) 867-0300 X262

Mike Fukushima
Califonia Department of Fish and Game
(707) 441-5797

Appendix Y: Useful Websites

WCGOP Observer Related Sites

West Coast Groundfish Observer Program:
http://www.nwfsc.noaa.gov/research/divisions/fram/observer/index.cfm

WCGOP Database Log-on
http://efcldev.nwfsc.noaa.gov/pls/noaa/logon.display

Pacific States Marine Fisheries Commission (PSMFC)
http://www.psmfc.org/index.html

Alaskan Observers, Inc. (AOI)
http://www.alaskanobservers.com

Medical- Blue Shield
http://www.wa.regence.com/

Fisheries Management on the West Coast:

Pacific Fishery Management Council (PFMC):
http://www.pcouncil.org/

NOAA Fisheries Northwest Regional Office (groundfish management):
http://www.nwr.noaa.gov/1sustfsh/gdfsh01.htm

International Pacific Halibut Commission:
www.iphc.washington.edu/halcom/default.htm

State Agencies

California Department of Fish and Game (DFG)
http://www.dfg.ca.gov/

Oregon Department of Fish and Wildlife (ODFW)
http://www.dfw.state.or.us/

Washington Department of Fish and Wildlife (WDFW)
http://wdfw.wa.gov/

Fisheries Research on the West Coast:

NOAA Northwest Fisheries Science Center:
http://www.nwfsc.noaa.gov/research/divisions/fram/index.cfm

Collaborative research: Partnerships for improved science and fisheries knowledge
http://www.fishresearchwest.org/

Pacific Marine Conservation Council
http://www.pmcc.org/news.html

Fisheries News:

Heads up: News connecting the West Coast Fishing Community
http://www.heads-up.net/

Fish Identification:

Fish Base: Database of over 28,000 species with images.
http://www.fishbase.org/search.cfm

Marine Safety:

The Alaska Marine Safety Education Council
http://www.amsea.org/

EPIRB On-line registration and forms
http://beaconregistration.noaa.gov/rgdb/forms/epirb.pdf

Vessel Information:

U.S. Coast Guard Vessel Search
http://cgmix.uscg.mil/psix/PSIX2/VesselSearch.asp

NW Region List of LE permits
http://161.55.16.25/main/nwp_system_version3/nwp_public/index_pub_permits.cfm

Marine Weather:

NOAA: National Weather Service
http://www.nws.noaa.gov/

iwindsurf.com: This web site provides an excellent GUI for real time wind reports
http://www.iwindsurf.com/windandwhere.iws

Observer Associations, Interest Groups:

Association for Professional Observers:
http://www.apo-observers.org/Observerweb/Sites/Links_navbar_side/linksfolder/links_obs_data.htm

Observer net:
http://www.observernet.org/obsforum/index.php

International Fisheries Observer Conference:
http://www.fisheriesobserverconference.com/

Observer Programs worldwide:

Domestic
North Pacific Groundfish Observer Program:
http://www.afsc.noaa.gov/refm/observers/default.htm

Alaska Marine Mammal Observer Program
http://www.fakr.noaa.gov/protectedresources/observers/mmop.htm

California/ Oregon Drift Gillnet Observer Program
http://swr.ucsd.edu/psd/codgftac.htm

Hawaii Longline Observer Program
http://swr.nmfs.noaa.gov/pir/index.htm

Northeast Fisheries Observer Program:
www.nefsc.noaa.gov/sos/fishobs/fishobs.html

Florida Museum of Natural History- Shark Fishery Observer Program:
http://www.flmnh.ufl.edu/fish/sharks/csop/csopjob.htm

Southeast Pelagic Observer Program
http://www.sefsc.noaa.gov/pop.jsp

Gulf of Mexico Shrimp Fishery Observer Program
http://galveston.ssp.nmfs.gov/galv/research/management.htm#observer_program

National Observer Program
http://www.st.nmfs.gov/st1/nop/

Foreign

Canadian at-sea fisheries observer program:
http://www.qc.dfo-mpo.gc.ca/peches/en/surveillance/programme.htm

Canadian observer provider:
www.biorex.com/services_e/th03.html

Canadian observer provider:
http://www.archipelago.bc.ca/fm-overview.htm

Canadian observer training:
http://web.mala.bc.ca/faep/Observer.htm#Overview

Marine Resources Assessment Group (MRAG) (multiple programs)
http://www.mragltd.com/

Antarctica CCAMLR:
http://www.ccamlr.org/pu/E/sc/fish-monit/fm-intro.htm

Australia:
www.afma.gov.au/observer%20program/default.php

GLOSSARY

A - B

ABC - "Acceptable Biological Catch" - the annual harvest level for each species based only on biological considerations

Aft - towards the stern or back end of a vessel

Amidships - midway between the bow and stern of a ship, or on the centerline

Anchor/Buoy lines - Sections of line that join the groundline and anchors on the bottom of the ocean to the buoys or "bags" on the surface.

Athwart ships - side-to-side across a ship, perpendicular to the centerline

Bag - the codend or another name for a buoy.

Bait bags/jars - Containers filled with ground bait that are hung inside pots to attract fish.

Beam - width of a ship

Benthic - living in direct relation with the bottom

Bias- Tending to yield one outcome more frequently than others. Factors affecting the randomness of a sample, including possible mechanical sorting of catch by an incline belt, or purposeful presorting by a crew member, will introduce bias.

Bight - a loop or turn in a line

Bleeder/Sorter - Crewman assigned to sort bycatch out of the catch, and to cut the "throat"of the cod.

Block/Hydro/Hauler - Hydraulically driven wheel into which the groundline is placed during gear retrieval. As the wheel spins the groundline is drawn on board.

Boat Share - the percentage of the gross which goes to the vessel owner

Bobbin - a round, rubber or steel roller used in the footrope of a bottom net to protect the net from damage

Bosun - person in charge of a ship's rigging, anchors, cables and deck crew

Bottom - (1) ocean floor, (2) fishing depth, or (3) a ship hull. Which meaning to apply must be taken from context.

Bow - the front section of a boat or ship

Bowline - a type of knot used to form an eye in the end of a rope.ii

Brailer - a type of netting that is attached to a crane and used to transport fish and other materials from one vessel to the dock or to another vessel

Breech - a behavioral characteristic of some marine mammals such as humpback whales, where they rise vertically out of the water, and then with most of their body above the surface, they fall to their back or side

Bridge - the control center of a ship

Bridle - wire attached to the headrope, footrope or side panel of a net, by which the net is towed

Bulkhead - a wall separating compartments of a ship

Bulwarks - the upper section of the side plating of a ship, which extends above and around the upper deck

C

Capstan (gypsy) - an upright, spool-shaped, power rotational cylinder around which cables or hawsers are wound

Catch Category – Categories comprised of one or more species for management purposes.

Catcher boat - vessel that is used for catching fish and that does not process (freeze) fish on board

Chaffing gear - protective carpeting (or strands of nylon forming a carpet pile) on the outer, underside of the trawl net to keep it from catching and ripping on obstacles on the bottom

Chief - the engineer; responsible for care of engines and deck machinery

Choker, choke strap - a loop of wire or rope used to cinch off the net or codend

Chopper - Machine used to grind frozen herring or squid for bait or the person assigned this duty.
Cleat - a heavy piece of wood or metal having two horns around which ropes may be made fast or belayed, usually secured to a fixed object such as the dock or deck
Coded wire tag - small tag (3mm) etched with binary code that are inserted into the snout of fishes for later identification
Codend - the end "bag" of a trawl net where the majority of the fish are collected and held
Coiler - Person or machine that is designated to coil line as it is retrieved by the block.
Combing - a low partition that separates the trawl deck from the side pockets
Companionway - entrance/stairway from deck to fo'c'sle and engine room
Compliance - being in accordance with the fishing regulations
Composition - In the groundfish Observer Program, this refers to the makeup of harvested species in a catch, and the sample you collect.
Cookie (disc) - a flat, round piece of rubber with a hole in the center strung on a wire rope or chain to protect it from abrasion and to stir up a mud cloud. Used on non-pelagic trawl gear.
Crucifier - A pair of rollers or steel pegs which stand vertically with only enough room for the groundline to pass between. During gear retrieval the groundline passes between the rollers and the hooks are pulled out of the fish.

D - E

Demersal - dwelling at or near the bottom
Discard – Everything that is not retained.
Disembark - to get off a vessel
Diver/Trailer buoys - A small buoy attached to the main buoy with a length of line. The diver buoy "trails" behind the main buoy and allows a larger target for grappling.
Dogs - Metal hooks that are hydraulically controlled to secure a pot to a launcher.
Door - a large steel or alloy structure attached to each main wire (in front of the net) to spread the net horizontally by means of hydrodynamic and friction forces
Draft - vertical distance from keel to waterline of a ship
Drop-off - Those organisms that fall or are knocked off of a hook prior to their being landed.
Drum - a metal spool or cylinder around which cable, etc. is wound
Drumhead - the top of a capstan, into which bars are inserted for leverage in turning it
Ebb tide - outgoing tide
EEZ - "Exclusive Economic Zone" - the term for the 200 mile jurisdiction zone, in which a nation has exclusive fishing rights, formerly called the FCZ
Embarkation - to board a vessel
EPIRB - "Emergency Position Indicator Radio Beacon"
Expansion straps (container lines) - a series of lines running around the circumference of a codend to provide strength and help maintain the shape of the bag

F

Fathom - a measure of length or depth equal to six feet
Fingers/Triggers - Small plastic strips located in the tunnel of a pot which allow fish to enter a pot but not exit.
Fishfinder - an electronic device for locating schools of fish under a vessel
Fishing line - a length of chain or wire in the bottom, front end of a net between the footrope and the bolsh line
Fishing mortality - Removal (deaths) of fish from a population due to fishing activity.

Flatfish - fish which are laterally compressed and orient themselves in the water with their lateral surfaces or sides towards the surface and bottom.
Flatlink - a piece of cut or cast hardware, generally oblong in shape, with leg diameter smaller in certain areas to allow attachment of a G-hook; used where wires must be connected and disconnected frequently
Flood tide - incoming tide
Fo'c'sle (from: forecastle) - the forward part of a ship where sailor's quarters are located
Footrope - on a non-pelagic net, a series of bobbins, tires or discs strung on chain or wire rope attached to the bottom front of a bottom net to protect the net from damage. On a midwater net, the rope or wire running along the front, bottom edge of the net.
Forward - towards the bow of a vessel
Fresh weight - the weight of the whole fish (or animal) as it was when alive. Also called round weight, whole weight.

G

Galley - ship's kitchen and/or mess hall
Gallows - structure from which trawl blocks are hung; separate units port and starboard
Gangion - The length of line that connects the hook to the groundline. It is often only two to three feet long.
Gantry - a frame structure, usually at the aft of a vessel, which supports pulleys (blocks) used in setting and retrieving trawl nets
Gas bladder - a sac filled with air or similar gases in the body cavity of a fish. May or may not be attached to the throat by a duct.
G-hook - a piece of cut or cast iron hardware in the shape of a "G", used with a flatlink where wires must be connected and disconnected frequently
Gill rakers - bony tooth like structures on the anterior edges of the gill arches. For protection or straining out food.
Gilson - a single hookline (as distinguished from a multiple block) used to assist in setting, hauling and moving gear on deck
Groundline/Mainline - The length of line to which all of the hooks are attached. This line is the "backbone" of the gear
Gunnel or Gunwale - the upper edge of the side of a boat
Gurdy - special winch for hauling of longlines or trolling lines
Gypsyhead - a metal drum with a smooth concave surface, usually mounted on a winch. Several wraps of line around the gypsy provide enough friction while it is turning to raise heavy loads smoothly because the line slips and is easily controlled, like the friction on a clutch plate.

H - K

Halibut excluder - A divider located in the tunnel of a pot that restricts the size of the opening.
Hatch - an opening in a deck or bulkhead of a ship.
Haul - a catch of fish from one tow of a net or longline
Haulback - when the vessel lifts the net out of the fishing depth
Hawser - any large rope (generally five inches or more in circumference) used primarily for towing, mooring or hauling
High grading - when a vessel puts up product but later discards it overboard in favor of a more valuable product
Hook - Usually a three pronged grappling hook used to snag the trailer buoy line.
Hook Counts - The average number of hooks per segment of gear.
Horn Off - To knock organisms off of a hook using the butt of a gaff.

I-beam - a steel beam shaped like an "I" in cross section
Intermediate - a gradually tapered section, generally of small mesh, between the back body of a trawl and the codend.
Joint Venture - a cooperative fishing/processing effort between vessels of different nationalities
Knot - a measure of time multiplied by distance, equaling speed. One knot equals one nautical mile (6080 feet) in one hour.

L - O

Launcher - Hydraulic lift, usually located on the port side of a vessel, used to "launch" pots over the side of the vessel and to adjust the angle of the pot when it is being emptied.
Lay - the direction in which the strands of a rope are twisted (right or left) or the degree of tightness with which they are twisted (soft, medium, hard, etc.)
Lazaret - a storage place between the decks of a ship
Lee, Leeward - the side protected from the wind, opposite the "windward" side
Live Tanks - tanks or bins on factory trawler vessels where the catch is dumped prior to sorting or processing
Lobby - another name for a fish bin on a catcher/processor
Main Wires - the two large cables used to connect the trawl net to the vessel while fishing
Master - fishing master and/or captain
Mustang suit - Insulated and waterproof coveralls worn in the cold months while sampling on deck.
Net reel - a hydraulic drum on the deck on which the net and most of the rigging are wound
Otter trawl - the type of net gear used on stern trawlers
Otterboard - another name for a trawl door
OY - "Optimum Yield" - a range within which summed Total Allowable Catches must fall

P

Panel - Mesh netting attached to a square metal frame. Two large panels and four smaller panels are attached to a heavy steel frame box to form the six sides of a pot.
Pelagic - midwater
Peritoneum - the lining of the gut cavity
Pew, Pew stick - a sharp-ended pole, which is used to skewer fish and toss them to another location
Pick/"Running the hook" - Hook connected to the end of the boom which is attached to the bridle and is used to lift a pot onto the launcher as the pot is being retrieved.
Plotter - Electronic mapping device that displays the local area and the vessel's position on it. The plotter allows skippers to record the area of a string and also the number of pots in a string on a digital map display.
Pod - a school of marine mammals; such as seals, whales or dolphins
Population - The total of individuals occupying an area or making up a whole. When sampling aboard a trawler, a population is defined as the catch from a single haul.
Porthole - a window in the hull or the outside bulkhead of a ship
Pot Tie - A short piece of line used to tie pots together when they are stacked on deck.
Predominant species - species that are the most abundant in the catch - not necessarily the target species
Presorting - the segregation and/or removal of any item(s) or organism(s) from the catch prior to the point where an Observer is collecting a sample.
Prohibited species or prohibited species groups - Species whose allowable retention is zero. Salmon, Pacific Halibut, and Dungeness crab are prohibited species.
Prohibited species sampling - the weight of groundfish catch sorted by the Observer to determine only the numbers and weights of salmon, herring, halibut, king crab, and tanner crab present
PSC - "Prohibited Species Catch" - a harvest limit usually placed on halibut, salmon, crabs or other species

which must be discarded in the groundfish fisheries

R

R.D.F. - Radio direction finder
Radio Call Sign - four letters and/or numbers, which are an international identifier of a vessel. The International Radio Call Sign (IRCS) is painted in large letters on the side of each vessel and on the deck of the flying bridge.
Random - Relating to a set, each of whose elements have an equal probability of occurring in a sample. These elements are chosen as sample units in a manner, which eliminates subjectivity.
Random sample frame - The population divided into independent countable units.
Regenerated scale - a fish scale that has grown in to replace one that was lost. Regenerated scales are useless for aging a salmon, but can be used to identify it to species.
Reserve - a portion of quota set aside at the beginning of the fishing year to allow for uncertainties in preseason estimates of DAP catch
Riblines - heavy lines or chains that run down the length of the trawl net to strengthen it
Roller - A device made up of one or more metal pins that spin allowing the groundline to be pulled up and over the rail of a vessel during retrieval such that tension and friction on the line is reduced.
Roller station/pit - Term used to describe the area where fishermen stand while retrieving the line and gaffing fish coming in over the roller.
Rollerman - A crewman who stands in the roller station and monitors the retrieval of the gear. The rollerman lands any commercially valuable fish and excludes any non-commercially valuable fish from being landed.
Rostrum - a pointed, calcareous, median extension on the anterior end of crab carapaces
Round weight - the weight of the whole fish (or animal) as it was when alive, synonymous with fresh weight and whole weight
Roundfish - fish that orient themselves in the water with the dorsal side towards the surface and ventral side towards the bottom
"Run pots" - A phrase used interchangeably with "retrieve pots". It is the phrase used in the vessel logbook to indicate the number of pots that have been retrieved from a string.

S

Sample size - The portion of the population that is sampled.
Sample type - The method used to select part of a population. This includes basket, whole haul, partial haul, and the pre-sorted "X" sample types.
Sample weight - The actual weight in kilograms of a composition sample.
Sampling - The process of selecting part of a population for the purpose of determining the parameters, or characteristics, of the whole population. Composition sampling refers to taking samples of a haul in order to determine the fishing mortality of species occurring in the sample.
Scupper - a hole in the bulwarks which allows water to drain from the deck
Segment of Gear - In this manual a segment of gear refers to the standard unit the vessel uses for measuring gear. This could refer to a mag, skate, tub, or coil of gear.
Set - The entire length of groundline from the first hook to the last hook, also referred to as a "string" of gear.
Sheave - a wheel with a grooved rim, such as is mounted in a pulley block to guide the rope or cable
Shot - A pre-measured length of buoy line, usually 10 to 20 fathoms long. Normally there are two set lengths, a "Long" shot and a "Short" shot. When setting a string, the skipper will tell the crew how many shots to tie to a pot for various bottom depths.
Skate - a length of longline gear, usually 100 fathoms or 600 feet long

Skate bottom - a fabric square with lines on the corners to tie it into a bundle once a longline "skate" has been coiled onto it.
Skate or Mag markers - Markers in the groundline that separate the sections of gear. These may be flourescent tape woven onto the line, knots, line splices, carabineers, or magazine (mag) clips.
Skates/Tubs/Coils - Terms used to describe the smaller segments of gear within a set or a magazine.
Spatial - Referring to a unit of space used in random sampling. For example: a third of a bin, or a section of trawl alley, are spatial units.
Species composition sample - to sort a defined weight of catch such that each organism sampled for is grouped by family or by species and to determine the number and weight of the organisms in each group
Spring line - a mooring line attached amidships
SSB - "Single Side Band" radio used for long distance contact
Stack - This term is used on pot vessels to refer to pots stacked on the back deck.
Starboard - the right side of a ship (when one is looking forward)
Stern - the aft or back end of a vessel
Stern ramp (slip) - a sloping ramp in the stern of a trawler between the deck and the water line, through which the net is set and hauled.
Stern trawler - any of various sized fishing vessels which trawl a conical shaped mesh net through the water, haul it up a ramp through the stern of the ship, empty, and process the catch to make a wholesale fish product. These vessels may fish for a month or more at sea without support.
String - Pots deployed individually and are not attached to one another in any way. This term refers to pots set at a similar time in a similar area and depth. What a skipper calls a string varies considerably between vessels. Strings are analogous to sets.
Sub-sample - the weight of catch designated by the Observer which weighs less than the sample weight and is processed for a supplemental task to determining the composition of a haul, such as sampling for average weight.

T - Z
Table - Some vessels have a sorting table on the back deck that pivots on one axis. The contents of a pot are dumped onto the table, and the table is swung out of the way to re-launch the pot.
TAC - "Total Allowable Catch" - annual harvest levels based on biological, economic and social factors
Taper - to cut webbing according to a given formula for fitting into a trawl
Tare - a deduction from gross weight to obtain net weight. Usually made to allow for the weight of a container.
Temporal - Referring to a unit of time used in random sampling. For example: one hour of processing time, or systematic intervals of ten minutes, are examples of temporal units.
Trawl - a cone shaped net, towed through the water to catch fish
Trawl Alley - the central passage on a trawl vessel where the codend is placed after haulback
Trawl Doors - often referred to as "doors," these are two metal plates, each attached to a main wire, designed to keep the mouth of the net open while fishing
Trip - the time period from when the vessel leaves harbor until it returns to harbor to offload product or catch
Trip Limit – The amount of a catch category that a vessel is allowed to retain by trip.
Tuning/Overhauling gear - Term used to describe the work involved in straightening hooks, replacing gangions, or splicing the damaged groundlines.
Tunnel - Short mesh-lined openings on two or three sides of a pot. These are the entrances to the trap. Fish and crab are able to swim in but are unable to make their way back out due to the fingers/triggers.
Under way - vessel in forward motion, running. According to Coast Guard regulation, a vessel is under way

if it is not at anchor or at dock, so a vessel adrift is technically under way.
Warp (main wire) - the cables on a trawler which run from the main winches to the trawl doors on the net
Weighed sample - a "basket" sample. The catch sampled by the Observer is weighed on a scale.
Winch - a hydraulic machine with one or more drums on which to coil rope, chain, or cable for hauling or hoisting
Wing - the sides off a trawl net near the opening, usually with larger mesh than the rest off the net
Wrister - a coated cloth tube worn on the arm, extending from the elbow and covering the wrists. Keeps arms warm and dry. Fish blood and slime are more easily washed out from these than from shirtsleeves.

Acknowledgements

Southwest Region, NMFS, Drift Gillnet Observer Program
North Pacific Groundfish Observer Program, National Marine Fisheries Service (NMFS)
At-Sea Observer Program, Dept. of Fisheries and Oceans, Canada

Andy Hickman	STAR
Brian Culver	Washington Department of Fish and Wildlife
C.M. Miri	Dept. of Fisheries and Oceans, Newfoundland
Commander Chris Woodley	US Coast Guard
D.W. Kulla	Dept. of Fisheries and Oceans, Newfoundland
Dan Harding	US Coast Guard
Dave Thomas	California Dept. of Fish and Game
Don Petersen	Southwest Region, NMFS
Dr. Richard Methot	Northwest Fisheries Science Center, NMFS
Erica Fruh	Northwest Fisheries Science Center, NMFS
Fran Recht	Pacific States Marine Fisheries
Gregg Williams	International Pacific Halibut Commission
J.R. Firth	Dept. of Fisheries and Oceans, Newfoundland
Jerry Dzugan	AMSEA
Joseph Arceneaux	Southwest Region, NMFS
Julia Parrish	University of Washington, Seabirds
Keith Mattheson	Oregon Department of Fish and Wildlife
LB Boyd	California Dept. of Fish and Game
Margaret Toner	National Observer Program
Mark Saelens	Oregon Department of Fish and Wildlife
Michele Robinson	Washington Department of Fish and Wildlife
Mike Fukushima	California Dept. of Fish and Game, State coordinator
Roy Torres	NMFS Enforcement
Sally Mizroch	National Marine Mammal Lab, NMFS
Sharon Davis	Alaska Fisheries Science Center, NMFS
Sheri O'Brien	STAR
Todd Hass	University of Washington, Seabirds